C21.5: 953/1

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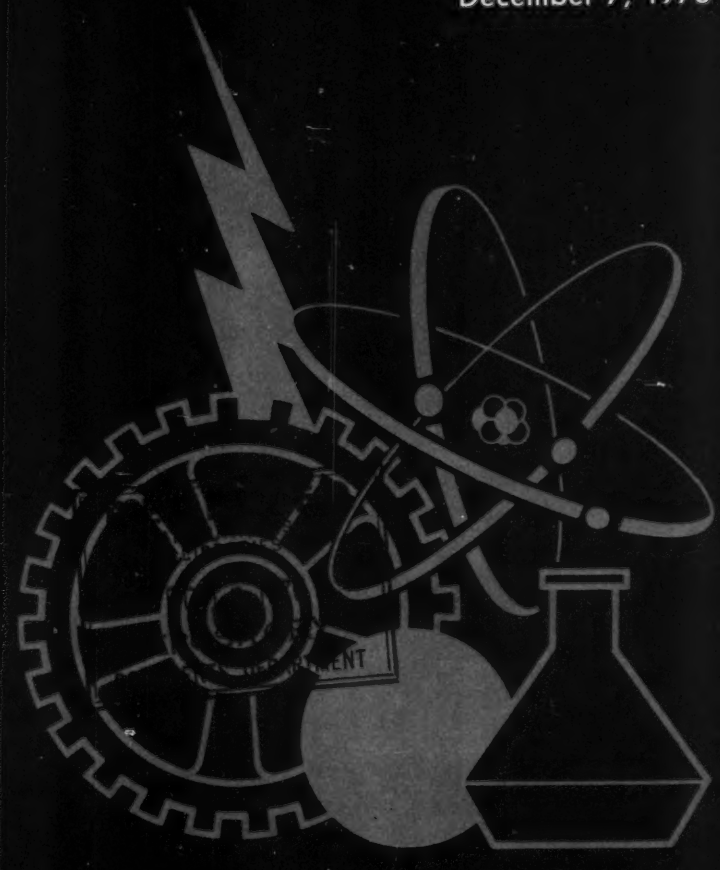
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 7, 1976



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 7, 1976 Volume 953 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Breeders' Rights in the Republic of South Africa

The notice of December 16, 1975, published in 942 O.G. 186 on January 6, 1976, identified certain plant varieties for which United States nationals may obtain breeders' rights in the Republic of South Africa. The basis on which these rights are available is explained in the Notice. We have been informed by the Republic of South Africa, however, that potatoes (*Solanum tuberosum*) should not have been included in the list of varieties eligible for protection. Accordingly, the Notice of December 16, 1975, is modified to this extent.

C. MARSHALL DANN,
Nov. 12, 1976. *Commissioner of Patents and Trademarks.*

National Inventor's Day

The 5th Annual Inventor's Day Exposition will be held on Saturday and Sunday, February 5 and 6, 1977 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by prospective participants. No application can be considered after December 1, 1976.

Other than electricity and alloted space—floor, wall or table top—all expenses associated with each exhibit are to be borne by the exhibitor. Arrangements for delivery, return, setup, and teardown as well as individual exhibit personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office, nor individual employees, can accept a collect shipment or provide storage.

The Patent and Trademark Office has established a committee which will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interests are prime considerations in selecting exhibits.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
June 14, 1976. *Chairman.*

Extensions of Time and Filing of Papers in Interferences

A recent sample of the interferences declared during fiscal years 1971–1975 has shown that since the 1950–1959 period there has been an increase of 27 days in the approximately one and one-half year pendency time of the average interference. This increase has occurred in spite of the Commissioner's notice of April 24, 1964, 802 O.G. 601, and an extensive revision of the interference rules in 1965.

While the failure to achieve any reduction in average interference pendency time may in part be attributable to the adoption in 1971 of 37 CFR 1.287(a)(2), which provides for the setting of additional time periods for purpose of discovery, it appears that a considerable reduction would result if the parties were to adhere to the times originally set by the Office, rather than seeking extensions of those times. Accordingly, stipulations or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Another factor which adversely affects the pendency time of the average interference is the number of papers filed. While parties are certainly entitled to exercise their rights in filing papers provided for by the rules, many papers are also filed that are not provided for by the rules, such as replies to replies to oppositions to motions under 37 CFR 1.231, and replies to oppositions to motions or petitions under 37 CFR 1.243 or 1.244. These unprovided-for papers appear to be generally unnecessary, cause a considerable increase in the size of the interference files, and delay determination of the motions or petitions to which they relate. Therefore, in the future papers filed in interference proceedings will be given no consideration unless they are specifically provided for by the rules. In this regard, particular attention is directed to 37 CFR 1.228, 1.231(b), 1.237, 1.243 and 1.244.

C. MARSHALL DANN,
Nov. 9, 1976. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,425,508, E. W. Faulstich, EXTENSION LADDER, **filed** Aug. 20, 1976, D.C., C.D. Calif. (Los Angeles) Doc. 76–C–3106, *Eugene W. Faulstich (Van Ladder, Inc.)* v. *Motac, Inc.*

3,584,398, Meyer and Tillotson III, TEACHING DEVICE HAVING MEANS PRODUCING A SELF-GENERATED PROGRAM, **filed** Aug. 17, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–2628–HP, *Centurion Industries, Inc. et al.* v. *Cybernetic Systems, Inc.*

3,628,529, W. D. Steimle, HYDRO-MASSAGE ASSEMBLY, **filed** Aug. 19, 1976, D.C., C.D. Calif. (Los Angeles) Doc. 76–2664–RMT, *Wayne D. Steimle* v. *South Pacific Industries, Inc.*

3,649,401, D. B. Gunnerson, METHOD OF MAKING CONTINUOUS FIBERGLASS FILAMENT OPEN WEAVE FRAMES AND STRUCTURES, **filed** Apr. 20, 1976, D.C. Ariz. (Phoenix) Doc. CV 76–277–Phx, *Loma Systems, Inc.* v. *Dale B. Gunnerson and Geostrand Products, Inc.*

3,658,327, G. S. Thiede, PULL TYPE EXERCISING DEVICE, **filed** Apr. 7, 1976, D.C., C.D. Utah (Salt Lake City) Doc. C–76–107, *Marcy Gymnasium Equipment Co. and Clifford S. Thiede* v. *X-L Equipment Co., Inc. and Peter W. Souvall.*

3,669,490, Semplonius and Kolk, CHAIR, **filed** July 25, 1976, D.C. Del. (Wilmington) Doc. 76–278, *Steelcase, Inc.* v. *Harvard Industries, Inc.*

3,695,374, W. T. Commons, DIRIGIBLE WHEEL VEHICLE, **filed** July 26, 1976, D.C. Oreg. (Portland) Doc. C–76–667, *Ward Commons* v. *Lilian R. Curtis Roberts and Michael Curtis.*

3,711,864, G. Dickstein, PROTECTIVE HELMET STRUCTURE, **filed** Jan. 25, 1973, D.C., N.D. Ohio (Cleveland) Doc. C73–79, *George Dickstein* v. *Seventy Corp. and Grantham, Inc.* Stipulation and order settling and dismissing action at plaintiff's costs, May 7, 1976. **Same, filed** Aug. 25, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75–1121–2, *George Dickstein* v. *Seventy Corporation and Grantham, Inc.* Patent is held invalid, therefore the decision of the District Court is reversed, Aug. 25, 1975.

3,713,926, L. L. Speer, METHOD FOR PATCHING MATERIALS, **filed** Mar. 18, 1976, D.C., N.D. Ohio (Toledo) Doc. 76–129, *Vyna-Chem (Canada) Ltd.* v. *Lawrence L. Speer et al.*

3,717,309, Luker and Skeem, GRINDING MILL, **filed** Apr. 14, 1976, D.C., C.D. Utah (Salt Lake City) Doc. C–76–120, *Gary L. Skeem, an individual, and Retsel Corporation* v. *All-Grain Company et al.*

3,748,640, V. Sardo, Jr., SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES, **filed** May 5, 1976, D.C., S.D.N.Y., Doc. 76–C–2065, *Vincent Sardo, Jr.* v. *General Motors Corporation.*

3,752,521, A. Lafebre, PROTECTIVE VEHICLE TRIM STRIP, **filed** July 2, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–2108–R, *Deluxe Auto Molding Inc.* v. *Adolph Lafebre.*

3,752,877, D. K. Beavon, RECOVERY OF SULFUR COMPOUNDS FROM TAIL GASES, filed Mar. 22, 1976, D.C., C.D. Calif. (Los Angeles) Doc. 76–917–LTL, *Environmental Designs, Ltd.* v. *Union Oil Co. of California and Ralph M. Parsons Co.*

3,791,346, Willinger and Dinnerstein, RODENT HABITAT, filed Apr. 1, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c1036, *Metaframe Corporation* v. *Pets International Ltd., Inc. and Genyk Products Limited.* Enter stipulation of dismissal without prejudice, Mar. 8, 1976.

3,797,702, J. D. Robertson, SCRAP RECOVERY AND FEED SYSTEM, filed Mar. 25, 1976, D.C., E.D. Mich. (Detroit) Doc. 76–70607, *Joseph D. Robertson and Process Control Corp.* v. *Hydreclaim Corp. et al.*

3,818,837, Jacoby and Lindqvist, VEHICLE AND TRACK SYSTEM, filed Feb. 3, 1976, D.C., N.D. Ill. (Freeport) Doc. 76–C–20004, *SI Handling Systems, Inc.* v. *Rockford Automation Inc.*

3,850,087, Landblom and Mecklenburg, CREPE GRIDDLE FOR MAKING THIN UNIFORM CREPES, filed June 21, 1976, D.C. Colo. (Denver) Doc. 76–W–632, *Creative Cookwear, Inc.* v. *WGN Sales, Inc.*

3,853,048, G. Collins, SHELLER DEVICE FOR PEAS AND THE LIKE, filed June 5, 1975, D.C., N.D. Ala. (Birmingham) Doc. 75–L–0719–S, *Jo Collins, doing business as Lady Jo Manufacturing Company* v. *Hold'Em, Inc.; Mr. Charles Bottcher; "A" through "Z," etc.* Plaintiff is owner of said patent. Said patent is valid and has been infringed by defendant, Charles Bottcher. Said defendant is enjoined from further infringement of said patent. Order that defendant's denials are without merit and dismissing with prejudice defendant's demands for relief, Mar. 10, 1976.

3,880,047, H. List, MIXER AND KNEADER WITH COUNTERACTIVE BLADES, filed Feb. 20, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–577–RJK, *Paul Dosier Associates, Inc.* v. *Advanced Controls Corp.* Same, filed Feb. 25, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–632–F, *Paul Dosier Associates, Inc.* v. *Excellon Industries.*

3,882,824, G. K. Acquaviva, GROOMING AID FOR HAIRY ANIMALS, filed Apr. 1, 1976, D.C., N.D. Ohio (Toledo) Doc. C76–158, *Gwendolyn K. Acquaviva* v. *William Van Noy and Farnam Companies, Inc.*

3,908,407, Brand and Hubbard, LADIES' KNEE-HIGH STOCKINGS WITH SUPPORTING CUFF, filed Nov. 19, 1975, D.C., W.D.N.C. (Statesville) Doc. ST–C–75–58, *American Corporation* v. *Ridgeview Hosiery Mill Company, Inc.*

Re. 26,954, G. B. Greene, TYPEWRITER WITH MEANS TO DECREASE RATE OF OPERATION TO PREVENT TYPE-BAR MALFUNCTION, filed Apr. 20, 1976, D.C.N.J. (Newark) Doc. 76–707, *George B. Greene* v. *Litton Industries, Inc. and Litton Business Systems, Inc.*

D. 219,118, Baker and Piecia, BOAT, filed Apr. 3, 1973, D.C. Colo. (Denver) Doc. C4864, *Sidewinder Marine, Inc.* v. *Starbuck Kustom Boats and Products, Inc.* Judgment, plaintiff's said design patent is declared invalid, and action is dismissed, Aug. 18, 1976.

D. 227,352, J. C. Meng and G. J. Driessen, PACKAGE WITH STAGGERED PRODUCT SLICES, filed Mar. 16, 1976, D.C., E.D. Wis. (Milwaukee) Doc. 76–189, *L. D. Schreiber Cheese Company, Inc.* v. *Land-O-Lakes, Inc. and Palmer Manufacturing Corporation.*

D. 233,218, E. C. Lynn, PACKAGING CONTAINER OR THE LIKE, filed July 16, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C–307, *Shamrock Industries, Inc.* v. *Elmer C. Lynn.*

D. 236,750, S. W. Worthington, REFUSE PACKER, filed Aug. 24, 1976, D.C., S.D. Iowa (Des Moines), Doc. 76–269–2, *Wayne Engineering Corporation* v. *New Way Manufacturing Company.*

D. 237,169, Hill and Marquardt, EXTENDED COUPLING FOR A TRAILER, filed July 13, 1976, D.C., E.D. Ill. (East St. Louis) Doc. 76–2–096, *Tri-Star Corporation* v. *Dean Johns, doing business as Dean Johns' Trailer Sales and Fairmont Steel Products Inc.*

PATENT NOTICES

Certificates of Correction for the Week of Dec. 7, 1976

Re. 28,532	3,953,810	3,972,706	3,977,546
Re. 28,781	3,955,700	3,973,113	3,977,557
D. 239,596	3,956,278	3,973,275	3,977,609
3,296,255	3,956,374	3,973,575	3,977,610
3,697,295	3,956,656	3,973,738	3,978,012
3,864,350	3,956,662	3,974,025	3,978,249
3,865,574	3,957,368	3,974,124	3,978,862
3,871,378	3,958,249	3,974,884	3,979,123
3,884,966	3,958,435	3,974,911	3,979,384
3,885,298	3,960,814	3,975,173	3,979,615
3,888,610	3,960,983	3,975,272	3,979,647
3,909,240	3,961,158	3,975,537	3,979,756
3,917,293	3,961,432	3,975,557	3,979,814
3,920,628	3,962,464	3,975,608	3,980,053
3,925,268	3,964,353	3,975,789	3,980,679
3,925,599	3,966,493	3,976,074	3,980,730
3,927,187	3,966,596	3,976,124	3,980,855
3,931,624	3,966,934	3,976,176	3,981,360
3,935,917	3,967,588	3,976,405	3,981,746
3,943,964	3,969,392	3,976,615	3,981,757
3,947,517	3,970,681	3,976,864	3,982,858
3,950,674	3,972,285	3,976,946	3,983,085
3,952,826	3,972,454	3,977,386	3,984,218
3,953,426	3,972,647	3,977,410	

Dedication

3,276,770.—*Augustus W. Griswold*, Rochester, N.Y. SHEET FEEDING APPARATUS. Patent dated Oct. 4, 1966. Dedication filed Sept. 16, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

2,936,704.—*Theo Hense*, Wilhelmshaven, Germany. HIGH SPEED PRINTING APPARATUS. Patent dated May 17, 1960. Disclaimer filed Oct. 6, 1976, by the assignee, *Olympia Werke AG*.

Hereby enters this disclaimer to claims 1, 19, 20 and 21 of said patent.

3,668,653.—*Donald G. Fair*, Belvidere, and *Harold L. Baeverstad* and *William G. Fisher*, Rockford, Ill. CONTROL SYSTEM. Patent dated June 6, 1972. Disclaimer filed June 1, 1976, by the assignee, *Sundstrand Corporation*.

Hereby enters this disclaimer to claims 28–30 of said patent.

3,831,113.—*Adel Abdel Aziz Ahmed*, Annandale, N.J. RELAXATION OSCILLATOR. Patent dated Aug. 20, 1974. Disclaimer filed Sept. 30, 1976, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 10, 11, 12 and 13 of said patent.

3,842,802.—*Douglas R. Lang* and *Graeme K. Hight*, Whatawhata Country, Hamilton, New Zealand. MARKER FOR USE IN THE DETECTION OF OESTRUS IN ANIMALS. Patent dated Oct. 22, 1974. Disclaimer filed Oct. 5, 1976, by the assignee, *New Zealand Inventions Development Authority*.

Hereby enters this disclaimer to claim 6 of said patent.

3,896,689.—*Francis D. Catlin*, Horseheads, N.Y. TAPER TURNING ATTACHMENT. Patent dated July 29, 1975. disclaimer filed Oct. 5, 1976, by the assignee, *Hardinge Brothers, Inc.*

Hereby enters this disclaimer to claims 1, 4 and 5 of said patent.

3,917,974.—*Oreste J. Lucchesi*, Bloomingdale, and *Donald A. Whiteman*, Crystal Lake, Ill. SCINTILLATION CAMERA BRIGHTNESS CALIBRATING APPARATUS. Patent dated Nov. 4, 1975. Disclaimer filed Oct. 4, 1976, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to claims 1 and 6 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 20, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Aso; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-29-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-20-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-2-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-13-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-22-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-22-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-27-76

Expiration of patents: The patents within the range of numbers indicated below expire during December 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,914,768 to 2,919,442 inclusive
Plant Patents..... Numbers 1,882 to 1,892, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 7, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T953,001
NATURALLY DEGRADABLE ACRYLONITRILE AND METHACRYLONITRILE POLYMERS

Brian Norman Hendy, 25, Robbery Bottom Lane, Mardley Hill, Welwyn, Hertfordshire, England

Continuation of Ser. No. 485,279, July 2, 1974, abandoned. This application July 22, 1975, Ser. No. 597,983

Claims priority, application United Kingdom, July 26, 1973, 35647/73

Int. Cl.² C08F *220/42*

U.S. Cl. 260—63 N

No Drawing. 18 Pages Specification

A uniform copolymer containing 50 to 98% molar of acrylonitrile units or 50 to 99.5% molar of methacrylonitrile units suitable for making naturally degradable articles (wrappings, bottles) which contains as at least one copolymerized component thereof 0.1 to 25% molar of uniformly distributed units of an ethylenically unsaturated ketone of specified formula.

T953,002
OPTICAL VIDEODISC PLAYBACK SYSTEM WITH PLURAL PHOTODETECTORS

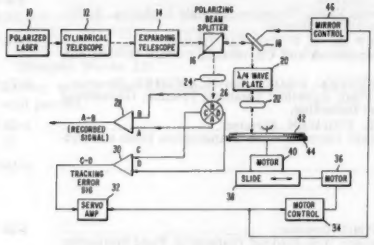
Arthur Herbert Firester, Skillman, N.J., assignor to RCA Corporation

Filed Sept. 30, 1975, Ser. No. 618,246

Int. Cl.² H04N *5/76*

U.S. Cl. 178—6 R

3 Sheets Drawing. 19 Pages Specification



An optical playback system is provided for a record having an information track comprising a succession of depressed areas alternating along the length of the information track with relatively non-depressed areas. Light is diffracted by the track to form a zero diffraction order cone of light, and a pair of differently deviated first diffraction order cones of light, each of the latter having a respective region of overlap with the zero diffraction order cone. A light detector, having four independent photosensitive elements disposed symmetrically about the center of a light accepting region of a common housing, is disposed in the path of the diffracted light so that the light accepting region intercepts the zero diffraction order cone. Two photosensitive elements detect two separate regions of overlap representing the recorded data. The remaining elements provide radial tracking signals. In one embodiment, the light beam is focused on the track as a circular light spot having a spot diameter greater than the track width, while in a second embodiment, the light beam is focused on the track as a substantially elliptical light spot having its major axis transverse to the track and its major axis dimension less than the track width.

T953,003
THERMOPLASTIC PAINTABLE POLYOLEFIN COMPOSITION

Andrea Fritz, Okemos, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1975, Ser. No. 622,428

Int. Cl.² C08K *3/04*; C08L *9/00*

U.S. Cl. 260—42.46

No Drawing. 11 Pages Specification

A paintable, scratch-resistant, thermoplastic composition containing 40–70% by weight of total polymer of an uncured copolymer of ethylene and higher α-olefin, said copolymer containing at least 67 weight percent ethylene units and having a Mooney viscosity of from 40–80; 30–60% by weight of total polymer of crystalline propylene polymer; and 20–50 parts carbon black per 100 parts of total weight of polymers having an oil absorption number of 50–140 cc's per 100 grams and a mean particle diameter of about 34–77 millimicrons.

T953,004
THERMOSETTING POWDER COATING AND PROCESS

Theron E. Parsons, III, 4145 Skyland Drive, Kingsport, Tenn. 37664

Continuation of Ser. No. 531,117, Dec. 9, 1974, abandoned, which is a division of Ser. No. 335,870, Feb. 26, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,135

Int. Cl.² C08L *1/26*

U.S. Cl. 260—15

No Drawing. 11 Pages Specification

A thermosetting powder coating composition comprising a resinous compound containing pendant hydroxyl groups such as alkyds, acrylics and cellulosics, a melamine formaldehyde resin and a catalyst is disclosed. The catalyst permits flow-out of the powder prior to becoming activated. A process for coating, using the composition, is also disclosed.

T953,005
SCHOTTKY BARRIER DIODE HAVING CHARGEABLE FLOATING GATE

Narasipur G. Anantha, Hopewell Junction, and Robert C. Dockerty, Highland, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 437,120, Jan. 28, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,284

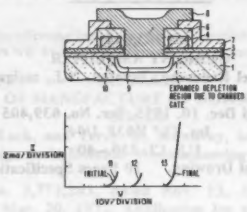
Int. Cl.² H01L *29/48*

U.S. Cl. 357—15

1 Sheet Drawing. 7 Pages Specification

A Schottky barrier diode having an encircling floating polycrystalline silicon gate which becomes charged upon avalanche breakdown of the diode. The gate is self-aligned with respect to the Schottky barrier diode metal so that the gate

uniformly overhangs the depletion area in the semiconductor when the diode is reverse biased. The gate is insulated from



the semiconductor material and from the metal by dielectric layers including silicon dioxide and silicon nitride.

T953,006

ANTISTATIC CELLULAR POLYOLEFIN RESIN PRODUCTS

Charles F. Raley, and John F. Rudd, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1976, Ser. No. 652,605
Int. Cl.² C08J *9/06*
U.S. Cl. 260—2.5 R
No Drawing. 9 Pages Specification

Antistatic cellular polyolefin resin products and articles thereof are provided wherein the olefin polymer composition of the cellular composition comprises an antistatic agent, especially an amine having at least one long aliphatic hydrocarbyl chain or a salt thereof, especially a quaternary ammonium salt, in amount effective to reduce the electrostatic charge decay half-life time to less than about 2 minutes in normal ambient air atmosphere.

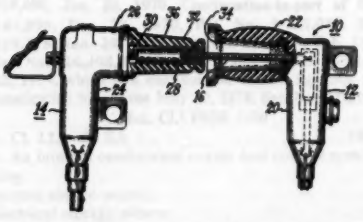
Typical are polyethylene foams having density from about 1.5 to about 50 pounds per cubic foot comprising from about 0.01 to about 5, preferably from about 0.1 to about 0.5, weight percent N,N-bis(2-hydroxyethyl)alkyl amine mixture wherein the alkyls are hexadecyl, octadecyl and octadecenyl.

T953,007

SHIELDED ELECTRIC POWER CABLE SEPARABLE CONNECTOR MODULE HAVING A MATING SURFACE COATED WITH A RESIN-BONDED SOLID FILM LUBRICANT

Henry N. Tachick, Pittsfield, Mass., and Leonard M. Small, Somersworth, N.H., assignors to General Electric Company

Continuation of Ser. No. 544,038, Jan. 27, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,639
Int. Cl.² H01R *15/04*
U.S. Cl. 339—111
1 Sheet Drawing. 5 Pages Specification



A shielded cable separable connector module is of the type having a contact assembly inside an insulating housing of elastomeric material. The housing includes a mating portion having a configuration suited for intimate engagement with a corresponding mating portion of a matching second module for establishing contact with the contact assembly of the second module. The improvement comprises a coating of phenolic resin-bonded polytetraflouroethylene solid film lubricant on the surface of at least the mating portion of the first module housing. A silicone grease may be used in addition to the solid film lubricant coating, if desired.

T953,008

Hydroxyethylmethylcellulose as a Protective Colloid in Vinyl Chloride Polymerization

George K. Greminger, Jr., and Earl H. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1976, Ser. No. 686,757
Int. Cl.² C08F *2/20*; C08F *14/06*
U.S. Cl. 526—200
No Drawing. 12 Pages Specification

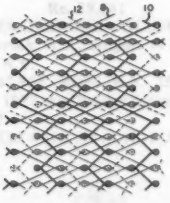
An improvement in the process for preparing polymers from vinyl chloride monomer in aqueous suspension particularly when using polymerization reaction temperatures of at least about 80°C, comprising the use of hydroxyethylmethylcellulose having a hydroxyethyl MS of about 0.7–3.5 and a methoxyl DS of about 0.6–1.6, as the protective colloid in the water phase of an oil-in-water suspension system.

T953,009

WARP KNIT PRODUCT AND THE PROCESS OF MAKING SAME

Heinz Neuhaus, 19 Winburne Drive, New Castle, Del. 19720

Filed Apr. 19, 1976, Ser. No. 677,989
Int. Cl.² D04B *21/00*
U.S. Cl. 66—195
2 Sheets Drawing. 11 Pages Specification



A warp knit two-way stretch fabric is provided by knitting three yarns into two interconnected grids of loops, one grid being of a first inelastic yarn alternating coursewise with elastic yarn to provide a repeat pattern of a plurality of interconnected loops of elastic yarn in alternate wales of the fabric and in the same sets of successive courses and a plurality of interconnected loops of inelastic yarn in intervening wales of the fabric, and the other grid being of a second inelastic yarn. The fabric is preferably made by alternate threading of the first inelastic yarn and the elastic yarn on the back guide bar of the knitting machine and the second inelastic yarn on the front guide bar. The back guide bar performs an underlap of at least two needles at least once in every nine courses in the fabric and the front guide bar moves in opposition to the back guide bar. The interconnected loops of elastic yarn occur when the back guide bar places a yarn loop from one end of elastic yarn of one course directly over a yarn loop from another end of elastic yarn of a preceding course. This placement also forms the interconnected loops of first inelastic yarn.

T953,010

HERBICIDAL COMBINATIONS AND METHOD OF CONTROLLING WEEDS IN CROPS

Edwin Frank Koldenhoven, Middleport, N.Y., assignor to FMC Corporation, New York, N.Y.

Continuation of Ser. No. 542,133, Jan. 17, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 680,995

Int. Cl.² A01N *9/22*

U.S. Cl. 71—93

No Drawing. 12 Pages Specification

Herbicidal r-2-alkyl-5-alkyl-c-5-(2-substituted-benzyloxy)-1,3-dioxanes used in combination with certain crop herbicides, e.g. metribuzin, reduce the injury to the crop while maintaining satisfactory control of broad-leaved weeds and improving control over undesired grasses. The invention is exemplified by the control of weeds in soybeans by the combination of a dioxane with metribuzin.

T953,011

TRANSPARENT IMPACT POLYSTYRENE PLASTICS OF MULTIPLE BLOCK COPOLYMERS

Robert C. Smith, Warren, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 431,531, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 237,587, March 15, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 629,746

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 B

1 Sheet Drawing. 13 Pages Specification

A transparent copolymer of butadiene and styrene of the BSBS type is produced which contains 60 to 90 per cent of block styrene, or preferably 70 to 85 per cent of block styrene. The copolymer is suitable for use in the manufacture of packaging films and molded items, including egg cartons, boxes of various types, window panes, etc.

T953,012

CURRENT AMPLIFIER

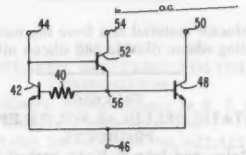
Jonathan Samuel Radovsky, Trenton, N.J., assignor to RCA Corporation

Filed Dec. 10, 1975, Ser. No. 639,405

Int. Cl.² H03F *3/04*

U.S. Cl. 330—40

1 Sheet Drawing. 10 Pages Specification



In a current mirror amplifier (CMA) circuit the desired gain may not be realized because of the effects of the base currents of the transistors comprising the CMA. A resistance of appropriate value is added in series with the base of a transistor in the input path thereby varying the base-emitter junction voltage of an output current determining transistor in the CMA output path which in turn modifies this output current in a manner so as to reduce the effects of the base currents.

REISSUES

DECEMBER 7, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

Re. 29,059

METHOD OF MANUFACTURE OF DOWN INSULATED GOODS

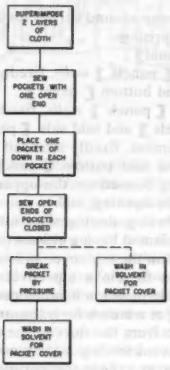
James W. Kack, and Terry W. Mowbray, both of Boulder, Colo., assignors to Holubar Mountaineering, Ltd., Boulder, Colo.

Original No. 3,771,203, dated Nov. 13, 1973, Ser. No. 236,080, Mar. 20, 1972. Application for reissue Feb. 21, 1975, Ser. No. 551,952

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.[2] D06M *17/00*

U.S. Cl. 28—77 **29 Claims**


SUPERIMPOSE 2 LAYERS OF CLOTH
SEW POCKETS WITH ONE OPEN END
PLACE ONE PACKET OF DOWN IN EACH POCKET
SEW OPEN ENDS OF POCKETS CLOSED
BREAK PACKET BY PRESSURE
WASH IN SOLVENT FOR PACKET COVER
WASH IN SOLVENT FOR PACKET COVER

21. A method of placing insulating down in a compartment in a garment comprising: Inserting in a down compartment in such a garment a down-containing packet made of a soluble film sealed against escape of down from said packet; securing said compartment closed and into a down-holding compartment; and immersing said compartment in a solvent for said soluble film to release down therein.

Re. 29,060

CIRCUIT FOR PROVIDING ELECTRONIC WARM-UP ENRICHMENT FUEL COMPENSATION WHICH IS INDEPENDENT OF INTAKE MANIFOLD PRESSURE IN AN ELECTRONIC FUEL CONTROL SYSTEM

Junuthula N. Reddy, Oakland County, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Original No. 3,771,502, dated Nov. 13, 1973, Ser. No. 219,490, Jan. 20, 1970. Continuation-in-part of Ser. No. 101,896, Dec. 28, 1970, Pat. No. 3,734,068, Ser. No. 219,275, Jan. 20, 1972, Ser. No. 226,486, Feb. 15, 1972, Ser. No. 226,498, Feb. 15, 1972, and Ser. No. 445,411, Feb. 25, 1974, which is a continuation of said Ser. No. 226,498. Application for reissue May 20, 1974, Ser. No. 471,511

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **10 Claims**

1. An internal combustion engine fuel control system comprising:

current source means;

electrical storage means;

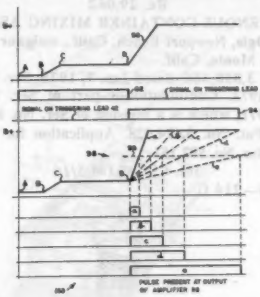
first control means responsive to one engine operating parameter for providing a threshold signal;

switching control means responsive to another engine operating parameter for switchingly connecting said current source means to said storage means to provide a timed series of *sequentially varied initial levels and* variable level injection command signals *each said command signal commencing at said initial level;*

transistor means for controlling current flow from said current source means to said storage means;

voltage level establishing means for supplying a normal operating bias voltage to said transistor control means;

means responsive to engine temperature for providing a



secondary bias voltage to the transistor means in response to engine temperature below a preselected level to reduce the rate at which current is supplied from said source means to said storage means and thereby increase the durations of said command signals; and

fuel delivery means commanded only by said series of command signals for supplying fuel to the engine whenever a command signal has a predetermined relationship with respect to the value of said threshold signal.

Re. 29,061

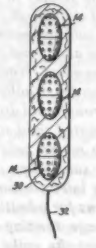
INTERNAL BLOOD COLLECTION

Louis Bucalo, Holbrook, N.Y., assignor to Microbyx Corporation, New York, N.Y.

Original No. 3,867,924, dated Feb. 25, 1975, Ser. No. 329,671, Feb. 5, 1973. Application for reissue Sept. 3, 1975, Ser. No. 609,917

Int. Cl.[2] A61B *5/14*; **A61F** *13/20*

U.S. Cl. 128—2 F **14 Claims**



1. In a method for collecting and analyzing the blood of a living being, the steps of introducing into a body of a living being whose blood is to be analyzed, at a preexisting, accessible cavity of the body which at least temporarily contains blood of the living being, a device having an interior capable of receiving and holding blood which is present in the cavity

when the entire device is introduced into and remains wholly within the cavity, [said device having a blood preservative preliminarily situated in its interior prior to introduction of the device into the body cavity for preserving blood which is received and held in the interior of the device,] said device being introduced into said cavity at a time which will assure presence of the device in the cavity when blood is present therein, removing the latter device from the body cavity after the device has remained therein for a period of time sufficient to receive and hold blood of the living being, so that blood is removed with the device, *said blood being contacted with a blood preservative for preserving the blood until the same can be tested*, and testing at least part of the blood thus removed from the body cavity with the device.

Re. 29,062

INTRAVENOUS CONTAINER MIXING ASSEMBLY

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, S. El Monte, Calif.

Original No. 3,858,580, dated Jan. 7, 1975, Ser. No. 302,783, Nov. 1, 1972. Continuation-in-part of Ser. No. 195,886, Nov. 4, 1971, which is a division of Ser. No. 830,311, June 4, 1969, Pat. No. 3,674,028. Application for reissue June 16, 1975, Ser. No. 587,151

Int. Cl.² A61M *5/16*

U.S. Cl. 128—214 C **10 Claims**

10. A novel device for the administration of intravenous fluids which comprises a fluid container having an open end and a closed end, an imperforate stopper in said open end, said container having two coaxial cylindrical compartments, a tippable center septum separating said compartments, a non-opaque drip meter having a fluid outlet at one end and a fluid inlet, said inlet comprising a tubular member terminating within said drip meter whereby drops can be visually observed at the end of said tubular member through said drip meter, extending from said drip meter an elongated rigid spike having an enlarged base adjacent said drip meter, said spike terminating in a point at its other end, said other end extending into said container, a filtered air inlet positioned in proximity to the base of said spike, means for admitting filtered air into said container, a fluid passage running through said base and having one end adjacent the spike at the exterior of said base so that essentially all of the fluid within said container can drain out by gravity through said fluid passage, and the other end of said fluid passage communicating with said tubular member, the point of said spike being adapted to puncture said stopper and tip said septum whereby contents of said container can be mixed without contamination from the exterior and the fluid contents can flow through said fluid passage and drip meter while filtered air passes into said vial.

Re. 29,063

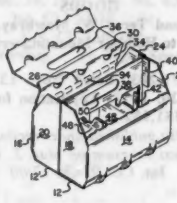
RETURNABLE WRAP-AROUND CARRIER

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Original No. 3,747,801, dated July 24, 1973, Ser. No. 185,178, Sept. 30, 1971. Application for reissue July 24, 1975, Ser. No. 598,868

Int. Cl.² B65D *75/00, 25/28, 25/22*

U.S. Cl. 206—141 **10 Claims**



1. A returnable wrap-around carrier for a plurality of full or empty objects comprising:

a. a bottom [panel] ;

b. a pair of side [panels] *walls*, fixedly attached to opposite ends of said bottom [panel] ;

c. a pair of end [panels] *walls*, fixedly attached to said bottom [panels] and said side [panels] *walls;*

d. a partition member, fixedly attached to said end [panels] *walls* and said bottom [panels], said partition member having formed on the upper portion thereof a partition handle opening; and

e. a top cover having sloping sides attached to said side [panels] *walls* and having at least one tear cut opening means formed on the top cover and having formed in the central portion therein a top cover handle opening in proximity to said partition handle opening, said top cover handle serving as a means for transporting the carrier and the full objects from the store to the consumer, said tear cut opening means serving as the means for rapidly opening the carrier to expose the partition handle opening, and said partition handle opening serving as the means for transporting the carrier and the empty objects from the consumer to the store, thereby providing a returnable, reusable wrap-around carrier.

Re. 29,064

SLIDING BEARING MEMBER

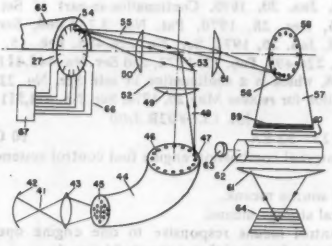
Nobukazu Morisaki, Aichi, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Original No. 3,852,203, dated Dec. 3, 1974, Ser. No. 425,895, Dec. 18, 1973. Application for reissue Aug. 26, 1975, Ser. No. 607,925

Claims priority, application Japan, Aug. 9, 1973, 48-89575

Int. Cl.² C10M *5/14*

U.S. Cl. 252—12.6 **8 Claims**



1. A sliding member made of a material consisting of 0.1–15 percent by weight of an organic fiber material having a length

less than about 3mm. and a diameter of about 15–50 microns and having oil affinity, 1–15 percent by weight of a hydrocarbon lubricating oil, and the balance of polyacetal resin.

Re. 29,065

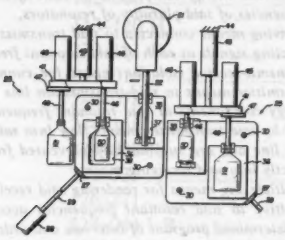
METHOD FOR BLOW MOLDING

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Original No. 3,767,747, dated Oct. 23, 1973, Ser. No. 103,624, Jan. 4, 1971. Application for reissue Oct. 21, 1974, Ser. No. 516,403

Int. Cl.² B29C 17/07

U.S. Cl. 264—89 10 Claims



10. In a method of blow molding plastic articles, the steps of: (1) extruding a parison at a first station; (2) closing a pre-form blow mold on said parison at said first station; (3) closing a final blow mold on a previously blown parison at a second station; (4) moving the closed pre-form blow mold to said second station and moving said closed final blow mold to a third station; (5) blowing the pre-form in said closed pre-form blow mold and blowing the final article in said closed final blow mold; (6) opening the pre-form blow mold at said second station while supporting the blown pre-form independently of said pre-form blow mold; (7) opening the final blow mold at said third station to release the final blown article therefrom; and (8) returning the open pre-form mold to the first station and returning the open final blow mold to said second station, preparatory to the next cyclic performance of steps (2) and (3) at said first and second stations respectively.

Re. 29,066

BIODEGRADABLE RADIOACTIVE PARTICLES

Roger L. Evans, Sunfish Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,663,685, dated May 16, 1972, Ser. No. 717,965, Apr. 1, 1968. Application for reissue Mar. 15, 1974, Ser. No. 451,438

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² A61K 43/00, 9/14

U.S. Cl. 424—1 16 Claims

1. Tiny free-flowing, unagglomerated radioactive particles of the order of about one-half micron to 1 millimeter in largest dimension, consisting essentially of a gelled vehicle of physiologically acceptable parenterally metabolizable sol-forming polysaccharide of the class consisting of glycogen, starch and dextran or protein of the class consisting of albumin, gelatin and hemoglobin having dispersed therein a physiologically acceptable inorganic carrier for radionuclides, said carrier having solubility product less than about 1×10^{-4}, said carrier containing a radionuclide and being present in said particles in amount ranging from that which is at least adequate to contain said radionuclide up to about 50% by weight based upon the weight of the vehicle, and said particle being resistant to leaching of said [radioisotope] *radionuclide* when immersed in water at 37° C. for at least about 15 minutes.

Re. 29,067

COMPACT FLATBED PAGE SCANNER

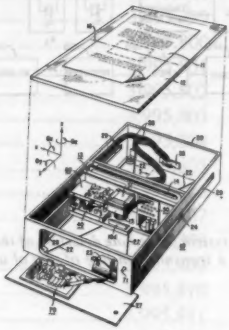
Hugh Alexander Watson, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,867,569, dated Feb. 18, 1975, Ser. No. 445,051, Feb. 25, 1974. Application for reissue June 13, 1975, Ser. No. 587,118

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² H04N 1/10

U.S. Cl. 178—7.1 4 Claims



3. A compact flatbed scanner for facsimile scanning comprising:

(a) a housing;

(b) a transparent plate mounted on the housing for supporting material to be copied, the transparent plate defining the approximate image plane of the material to be copied;

(c) a moving scanning assembly supported within the housing beneath the transparent plate, the scanning assembly comprising:

(1) means for mounting at least one lamp for illuminating at least a portion of the image plane,

(2) a linear solid state imaging device for detecting variations in intensity of light reflected from a scanning line on the image plane and having electrical contacts adapted to provide electronic scanning over the length of the scanning line, and

(3) an optical system for focusing the light reflected from the scanning line onto the linear imaging device, the optical system comprising a plurality of long narrow mirrors for folding the optical path from the scanning line to the linear imaging device;

(d) means for mechanically displacing the scanning assembly relative to the image plane in a direction parallel to the image plane and perpendicular to the scanning line to permit scanning a succession of parallel lines from one end of the image plane to the other; and

(e) electrical circuitry for sequentially reading out each scanning line detected by the linear imaging device by forming an electrical signal representative of the variations in intensity of light reflected from the image plane along a succession of scanning lines.

Re. 29,068

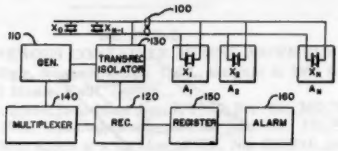
APPLIANCE REMOVAL ALARM SYSTEM FOR MOTELS

Walter S. Schopfer, Harrison, N.Y., and Dieter Wuerth, West Boyleston, Mass., assignors to WLW Corporation, Danville, Va.

Original No. 3,766,540, dated Oct. 16, 1973, Ser. No. 139,049, Apr. 30, 1971. Application for reissue Sept. 18, 1974, Ser. No. 507,077

Int. Cl.[2] G08B *25/00;* **H04Q** *9/00*

U.S. Cl. 340—280 **24 Claims**



23. A detection system for remote detection of the presence in or absence from a transmission line of any of a plurality of resonators, each of said resonators being connectable with and disconnectable from said transmission line, the combination of,

a. a plurality of crystal resonators, each of said resonators being resonant at a frequency which is one of an ordered set of frequencies and different from the resonant frequency of the others of said plurality, each of said resonators when connected with said transmission line being set to ringing by application of a voltage at said one frequency to said transmission line, and

b. an alarm set remote from said resonators connected to said transmission line, said alarm comprising,

i. transmitter means including a variable controlled oscillator for generating sequential electrical signals having substantial energy components at each of the resonant frequencies of said plurality of resonators,

ii. receiving means connected to said transmission line for detecting signals at each of said resonant frequencies,

iii. transmit-receive isolation means for connecting said transmitter means to said transmission line so that the energy components at said resonant frequencies generated by said transmitter means flow into said transmission line and are substantially prevented from flowing directly into said receiving means,

iv. multiplexing means for rendering said receiving means sensitive to said resonant frequencies according to a predetermined program of intervals and order,

v. alarm means connected to said receiver means responsive to a departure from said program, and

vi. counting means connected to said multiplexing means for counting signals corresponding to each detected resonant frequency.

PATENTS

GRANTED DECEMBER 7, 1976

ERRATA

For CLASS	See PATENT NO.
074–230	3,995,487
082–002.7	3,995,524
102–056 SC	3,995,549
102–066	3,995,550
113–120 H	3,995,572
273–131 B	3,995,704
244–016	3,995,799
244–078	3,995,800
244–158	3,995,801
224–008 R	3,995,802
224–033 A	3,995,803
126–271	3,995,804
228–044.1 R	3,995,805
229–017 R	3,995,806
229–038	3,995,807
229–073	3,995,808
237–002 B	3,995,809
237–008 R	3,995,810
239–085	3,995,811
239–458	3,995,812
239–584	3,995,813
241–005	3,995,814
241–015	3,995,815
241–023	3,995,816
241–030	3,995,817
241–046.11	3,995,818
241–058	3,995,819
259–148	3,995,867
219–058	3,995,870
296–010	3,995,890
296–102	3,995,891
297–219	3,995,892
297–452	3,995,893
298–010	3,995,894
298–022 R	3,995,895
339–092 M	3,995,947
352–129	3,995,946
404–071	3,995,965
417–254	3,995,966
260–674 A	3,996,031
320–002	3,996,063
429–208	3,996,065
429–185	3,996,066
429–101	3,996,068
429–197	3,996,069
526–263	3,996,204
536–017	3,996,205
536–119	3,996,206
318–258	3,996,504
065–003 C	3,996,603

PATENTS

GRANTED DECEMBER 7, 1976

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,995,320
PROTECTIVE JACKET

Samuel L. Zafuto, 436 75th St., Niagara Falls, N.Y. 14304

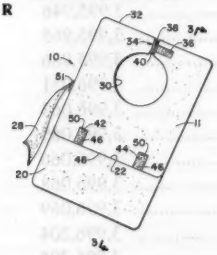
Filed July 18, 1975, Ser. No. 597,071
Int. Cl.² A41D *13/00*
U.S. Cl. 2—2 **2 Claims**

1. A protective jacket for use during sports activities of the type having an operative position in covering relation to the wearer's chest area for absorbing the impact of a blow that may be applied thereagainst within said chest area of a possible force of 1500 lbs per square inch, said jacket comprising a rear and a front plastic panel arranged in facing relation to each other, each panel being of a size coextensive with said chest area, a peripheral heat seal joining said panels to each other so as to define therebetween a pressure air compartment to provide said absorbing function in relation to said applied blow, a body of pressure air of approximately 9 lbs. per square inch confined within said compartment so as to hold said front and rear panels in separated clearance positions from each other, and an operative arrangement of a plurality of vertically oriented adjacently positioned heat seals joining said front and rear panels to each other in which each said heat seal is of a selected length of one inch and spaced from an adjacent heat seal one-quarter inch so as to define a constricted airflow passageway therebetween in said spacings between said adjacent heat seals, substantially all of the heat seals other than the peripheral heat seal being formed along lines that extend in a single direction with adjacent heat seals extending along the same line said arrangement of such heat seals delineating said pressure air compartment into smaller compartments communicating with each other through a plurality of said constricted airflow passageways, whereby a blow applied against a selected smaller compartment causes an optimum minimum displacement of pressure air therefrom due to the constricted airflow through said plural passageways to thereby result in effective cushioning of said blow.

3,995,321
DISPOSABLE PROTECTIVE BIB

Sally Johnson, Hohokus, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1976, Ser. No. 681,219
Int. Cl.² A41B *13/10*
U.S. Cl. 2—49 R **4 Claims**

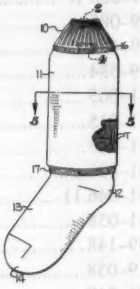


1. A disposable protective bib comprising:
a disposable substantially rectangular sheet of flexible material having an opening adjacent one transverse edge thereof dimensioned to fit around the neck of a child, said sheet having a slit therein extending radially from said opening to said edge;
a pocket member having a transverse opening therein formed adjacent the other transverse edge of said sheet;
an adhesive tab affixed adjacent one edge of said slit having a free end thereof adapted to transverse said slit and to be detachably affixed adjacent the other edge thereof to thereby secure said edges in juxtaposed relation;
and a plurality of adhesive elements secured to said pocket member along an edge defining the opening therein said elements having free ends extending beyond said edge and adapted to be affixed to an external supporting surface to thereby maintain said pocket in an open food-catching position.

3,995,322
CUSHION TOP SOCK

Robert E. Chesebro, Jr., Sheboygan, Wis., assignor to Wigwam Mills, Inc., Sheboygan, Wis.

Filed Mar. 22, 1976, Ser. No. 669,334
Int. Cl.² A41B *11/00*
U.S. Cl. 2—239 **5 Claims**



1. A seamless knit sock particularly adapted for use with ski boots and the like comprising a leg portion, an upper cuff portion, and heel and foot portions knit throughout of body yarn, said upper cuff, heel and foot portions being devoid of terry loops, at least that medial area of said leg portion adapted to be engaged by the top and upper edge of the ski boot also being knit with a terry yarn forming terry loops extending inwardly and entirely around the circumference of said leg area to provide additional fabric thickness in said leg area for cushioning the leg of the wearer against chafing by the top and upper edge of the ski boot.

3,995,323
METHOD OF PREPARING BONE ENDOPROSTHESIS MODEL AND ENDOPROSTHESIS OF PROXIMAL FEMUR PREPARED WITH THE AID OF SAID MODEL

Yakov Isaevich Shersher, 1 Degtyarny proezd, 3, kv. 42, Saratov, U.S.S.R.

Filed Oct. 20, 1975, Ser. No. 624,119
Claims priority, application U.S.S.R., Oct. 31, 1974, 2069253
Int. Cl.² A61F *1/24;* **B29C** *1/02*
U.S. Cl. 3—1.913 **2 Claims**

1. A method of preparing a model of a bone endoprosthesis comprising the following steps: dividing the bone procured

from a cadaver and corresponding to the bone to be replaced by an endoprosthesis into two, practically equal parts; removing the spongy tissue therefrom, thus forming groove-like excavations in each part; bringing together the above parts so

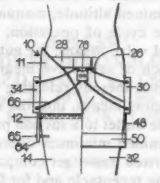
as to form a cavity of said grooves, intended as a casting mold; making a ventilation and a filling orifices in said casting mold wherethrough a self-hardening filling compound is poured, and subsequently disassembling the casting mold and removing the model therefrom.

3,995,324

ACTUATOR DEVICE FOR ARTIFICIAL LEG

John L. Burch, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 12, 1975, Ser. No. 612,965
Int. Cl.² A61F *1/08, 1/00*
U.S. Cl. 3—1.2 12 Claims



1. An actuator device for moving an artificial leg of a person having a prosthesis for replacing an entire leg and hip joint including a trunk socket for positioning about the person's waist for receiving the trunk portion of the removed leg and an artificial leg connected to said trunk socket by a pivotable hip joint, said artificial leg comprising an artificial thigh section, an artificial lower leg section, and an artificial foot section, connected together by pivotable joints, said actuation device comprising:

a. a first articulated hip joint assembly for positioning adjacent a natural leg of the person's body including:

i. a housing;

ii. flexible bladder means carried within said housing containing a fluid,

iii. compressing means carried within said housing adapted for connection to said natural leg for compressing said bladder means in response to the walking movement of said natural leg,

b. a second articulated hip joint assembly carried by said trunk socket of said prosthesis including:

i. a housing,

ii. flexible bladder means carried within said housing containing a fluid,

iii. bladder engaging means carried within said housing connected to said artificial leg for moving said artificial leg in response to said bladder means being expanded,

c. conduit means interconnecting said bladder means of said first and second hip joint assemblies;

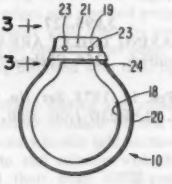
whereby movement of said natural leg causes said compressing means to compress the bladder means and fluid therein of said first hip joint assembly forcing said fluid through said conduit means into said bladder means of said second hip joint assembly to expand said bladder means to engage and move said bladder engaging means causing said artificial leg connected thereto to move in a walking motion.

3,995,325

MOISTURE COLLECTOR FOR TOILET

Ann L. Baffico, 168 Arbor Lane, San Mateo, Calif. 94403

Filed Sept. 9, 1975, Ser. No. 611,745
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 10 Claims



1. A moisture collector for the upper margin of a toilet comprising: a first absorbent band having an absorbent surface and a width less than the height of a toilet; means coupled with the first band for releasably attaching the same in a first operative position to the toilet with the absorbent surface extending along and engaging the upper side and front marginal portions of the toilet; a second absorbent band having an absorbent surface; and means on the second band for releasably attaching the same in a second operative position to the toilet with the absorbent surface of the second band extending across and engaging the rear flat upper portion of the toilet, the attaching means of each band having a size sufficient to assure that at least a major part of the absorbent surface of the band is in direct contact with the respective portion or portions of the toilet, the ends of the second band being adjacent to the respective ends of the first mentioned band when the bands are mounted in said operative positions on the toilet so that the band will be in a position to intercept and absorb moisture directed toward or along the respective portion or portions.

3,995,326

BIDET TOILET SEAT

Harry M. Umann, 8383 Wilsire Blvd., Suite 510, Beverly Hills, Calif. 90211

Filed Aug. 1, 1975, Ser. No. 601,229
Int. Cl.² A47K *3/22, 11/08*
U.S. Cl. 4—7 12 Claims

1. A bidet toilet seat, comprising:

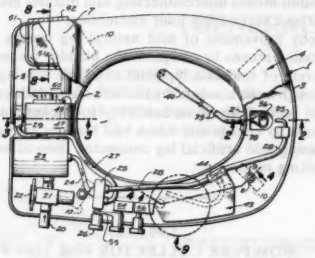
a. a housing in the form of a toilet seat having a central opening:

b. a downwardly directed water jet outlet within the housing;

c. means including a supply line contained in the housing for supplying heated water under pressure for jet discharge of water therefrom;

d. a collector funnel space downwardly from the jet outlet in the path of water jetted therefrom for receiving the water

jetted therefrom and forming with the jet outlet an antisiphon means;



e. and a bidet nozzle connected to the collector funnel and positioned at the hinged side of the housing for discharging water into the central opening.

3,995,327

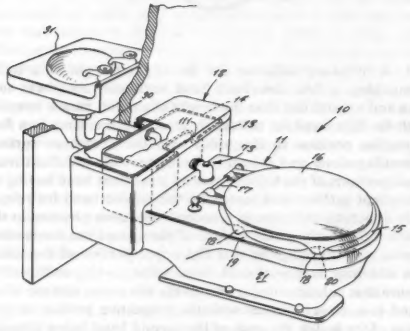
WATER SAVING TOILET ARRANGEMENT

John Richard Hendrick, 3255 Chelsey St., Mohegan Lake, N.Y. 10547

Filed Feb. 11, 1975, Ser. No. 549,078

Int. Cl.² E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—10 **13 Claims**



1. A toilet comprising a toilet bowl; a water supply tank assembly disposed on said bowl; self-flushing piston means disposed on said tank assembly for mixing fresh and recycled water, said self flushing means comprising a stationary outer cylinder, a stationary inner cylinder disposed within said outer cylinder, each of said cylinders having a port at its bottom end, upper and low outer tubes disposed in said inner cylinder, said lower outer tube projecting through said ports, the lower end of said lower outer tube having a clunch means for closing said outer cylinder port, and a vertically slidable plate means for securing said tubes together; a toilet seat disposed on said bowl; and a lever means coupled to said seat and said plate for actuating said piston means.

3,995,328

VACUUM TOILET SYSTEM

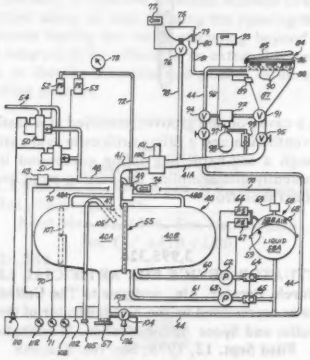
Raymond J. Carolan, Seattle, and Bjorn R. Kristoffersen, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1974, Ser. No. 532,569

Int. Cl.² E03D *5/016*

U.S. Cl. 4—10 **29 Claims**

1. A vacuum flush waste disposal system for an aircraft having a pressurized passenger compartment, said system comprising: a receptacle mounted within the pressurized passenger compartment for receiving waste; said receptacle having an outlet from which the waste is to be extracted; a tank for holding the waste; a first valve means connected to said receptacle outlet; a waste conduit interconnecting said tank with said first valve means; a recovery system contained within the tank for producing filtered liquid; a liquid pressure pump connected to the tank for withdrawing and pressurizing the filtered liquid; spray means mounted within the upper portion of the receptacle for cleaning the inner surface thereof; a second valve means operatively connected to said spray means for controlling the flow of liquid therefrom; a flush fluid conduit connecting the liquid pressure pump with said second valve means; means for venting the tank to ambient air pressure so as to induce a pressure differential between the tank



and said first valve means, above a predetermined altitude; an air suction pump connected to the tank for producing a predetermined vacuum pressure in the tank when the aircraft is below said predetermined altitude; manually actuated means having an automatic cycle of operation; connected to both said first and second valve means, for automatically opening and then closing each of said valve means after a predetermined interval of time; thereby releasing pressurized filtered liquid through the spray means, into the receptacle and subjecting the receptacle outlet to a suction pressure corresponding to the predetermined minimum differential between the tank and the pressurized passenger compartment for removal of the waste from the receptacle and for flowing the received waste through said conduit into the waste holding tank; and said receptacle incorporating suction-break means for preventing the application of a suction force to an occupant.

3,995,329

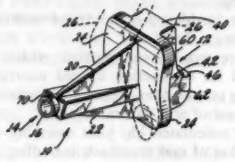
FEMALE URINARY DEVICE

Clyde E. Williams, P.O. Box 527, Rancho Santa Fe, Calif. 92067

Filed Oct. 10, 1975, Ser. No. 621,360

Int. Cl.² A47K *11/02;* **E03D** *13/00*

U.S. Cl. 4—110 **11 Claims**



1. A urinary device for females, comprising:

a. a urinary body having a urine collecting and sealing upper portion and having a urine discharging lower portion,

b. said lower portion extending downwardly from said upper portion and being elongated in a downward direction, said lower portion having a fluid passageway therethrough for urine discharge,

c. said upper portion terminating in front, rear and side walls projecting upwardly from the end of said upper portion opposite to said lower portion and forming a continuous wall boundary of said upper portion of generally rectangular configuration, said front and side walls being generally parallel to the axis of said fluid passageway and said rear wall extending at an abrupt angle to said axis and extending in a direction partly forwardly, the upper edges of each side wall concavely curving on a line having a forward and major portion extending primarily laterally of said axis and relatively gradually curving and a rear minor portion extending primarily longitudinally of said axis and relatively abruptly curving, said side walls having such spacing as to each fit between one spread labia majora and the adjacent labia minora of an average adult female and said front and rear walls having such spacing as to extend generally from the mons pubis immediately forward of the preputium clitoridis to immediately forward of the pars intermedia, said concavely curving of said side wall edges generally matching the curve of the flesh of the average adult female in the abutted areas but being more abruptly curved than said flesh so as to produce some flesh distortion in pressing said body into place to help perfect a seal by said walls, and

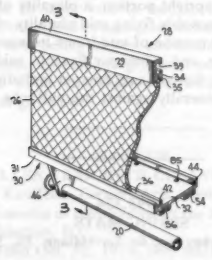
d. said fluid passageway communicating with the space between said walls.

3,995,330

SHOWER SHELVING UNIT

Robert D. Meyers, P.O. Drawer "B", Chester, Md. 21619

Filed Aug. 20, 1975, Ser. No. 606,097
Int. Cl.² A47K *17/00*
U.S. Cl. 4—146 **11 Claims**



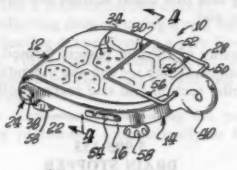
1. In a shower stall having means for preventing water from splashing outside the stall, the combination therewith of shelving means for holding toilet articles, said shelving means being mounted on top of said water splashing means, wherein said shelving means comprises a substantially horizontal shelf member and a substantially vertical shield member joined at respective edges thereof, said toilet articles being viewable from within said shower stall, said shield member extending above said shelf member and being of sufficient height to shield said articles from view from outside said stall.

3,995,331

INFANT BATH AND LOUNGE SEAT

Sandra H. Fotre, 2351 Siena Court, and Donna I. Boeckman, 2326 N. Indian Hill Blvd., both of Claremont, Calif. 91711

Filed Feb. 2, 1976, Ser. No. 654,296
Int. Cl.² A47K *3/064, 3/03*
U.S. Cl. 4—185 B **10 Claims**



1. An infant care accessory for use as an infant bathing and lounging cradle and an article carrier, comprising:

a pair of hinged shell-like sections each including a main support wall having side and end edges, and an edge wall along said side edges and one end projecting beyond one side of said support wall, whereby each section has an open end along its opposite end edge,

said sections being disposed with their open ends adjacent one another,

hinge means pivotally joining the adjacent ends of said sections for relative rotation of said sections between unfolded positions wherein said sections are disposed in generally end to end relation with their support walls lowermost and their edge walls projecting upwardly above the support walls to form an infant bathing and lounging cradle, and folded positions wherein said sections are disposed in confronting relation with their support walls facing one another and their edge walls projecting toward and into close proximity to one another to form an article carrier,

means for releasibly securing said sections to one another in their positions to retain said accessory in its carrier configuration,

means for supporting said accessory in its unfolded cradle configuration, and

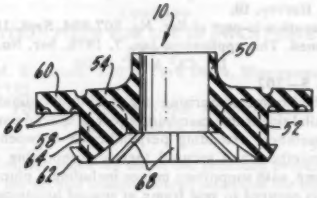
handle means attached to said accessory for holding the accessory in its folded carrier configuration.

3,995,332

FIN TUBE SEAL

James Franklin Forchini, and Joseph Michael Schwinn, both of Healdsburg, Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed May 8, 1975, Ser. No. 575,893
Int. Cl.³ E03C *1/00*
U.S. Cl. 4—187 R **5 Claims**



1. A hot water distribution basin; comprising:

a. a basin floor;

b. a vertical heat exchange element extending upwardly through an opening in said basin floor; and

c. sealing means for effecting a leakproof seal at the inter-

face between said basin floor and said heat exchange element, said sealing means including:

i. a first collar section received around and in contact with said heat exchange element;

ii. A second collar section received within said opening in said basin floor;

iii. a substantially horizontal compliant web section connecting said first collar section and said second collar section; and

iv. a plurality of flexible gussets formed integrally with said compliant web section and extending between said first collar section and said second collar section.

3,995,333

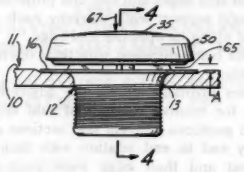
DRAIN STOPPER

James B. Stephens, La Crescenta, Calif., assignor to Graning Company, El Monte, Calif.

Filed Oct. 20, 1975, Ser. No. 623,827

Int. Cl.² A47K 1/14

U.S. Cl. 4—286 **15 Claims**



1. A closure for a drain port that passes through a boundary of a receptacle, comprising: a base member to support the closure at the drain port; a fulcrum on the base member facing away from the drain port when the base member is installed; a bi-stable disc spring having two stable configurations; a first actuator; a second actuator; a contactor on each actuator, the contactor on the first actuator being on the opposite side of the fulcrum from the contactor on the other actuator viewed in a radial section, said actuators both being on the same side of the spring, whereby pressing one actuator against the spring and the spring against the fulcrum moves the other actuator in the opposite direction and changes the configuration of the spring; and seal means carried by the outermost of the actuators so disposed and arranged as to bear against a surface surrounding the drain port and to close the drain port in a first spring configuration, and to move away from it and open the drain port in the second spring configuration.

3,995,334

BED FRAME

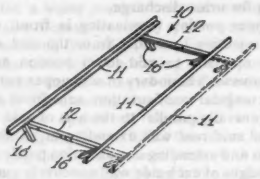
George M. Harris, Chicago, Ill., assignor to Harris-Hub Company, Harvey, Ill.

Continuation-in-part of Ser. No. 507,084, Sept. 18, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,207

Int. Cl.² A47C 19/00

U.S. Cl. 5—202 **24 Claims**

1. A bed frame comprising: a pair of longitudinally extending parallel side frame members; a pair of spaced parallel cross frame members extending perpendicular between said side frame members and secured thereto; supporting means for said frame, said supporting means including a plurality of leg members secured to said frame at spaced locations, each leg member including a first leg element having an upper end and a lower end with a floor engaging member on the lower end, each leg element having an upper portion fixed to said frame by a direct connection to locate said upper ends under said side frame members and to locate said floor engaging members substantially inwardly of said side frame members, each leg element being inclined with respect to said cross frame members, the included angle of inclination being in the range of 30° to 60°, each leg element extending inwardly and downwardly a sufficient distance so that each said lower end is



cantilevered inwardly and below said side frame member and said floor engaging member is located entirely inwardly of said direct connection.

3,995,335

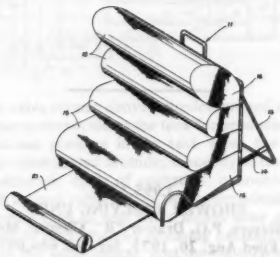
PILLOW FOR INVALIDS

Elizabeth E. Neely, 34 Highland Drive, N.E., Atlanta, Ga. 30305

Filed Feb. 10, 1976, Ser. No. 656,899

Int. Cl.² A47C 21/00; A47G 9/00

U.S. Cl. 5—327 B **6 Claims**



1. A pillow apparatus for supporting a person in bed in a generally sitting position, said pillow apparatus comprising a frame including an upright portion, a plurality of pillow sections, means for removably fixing said plurality of pillow sections to said upright portion of said frame in superposed relation to one another, and a bumper fixed to said frame and extending forwardly thereof, said bumper including a bumper pillow disposable generally against the buttocks of said person.

3,995,336

SPRING MATS

Herman E. Vanderheyden, 6e Loveldlaan 24, 9880 Aalter, Belgium

Filed Aug. 22, 1975, Ser. No. 606,947

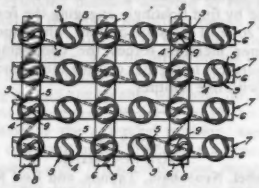
Claims priority, application Belgium, Sept. 9, 1974, 819439

Int. Cl.² A47C 23/04

U.S. Cl. 5—263 **8 Claims**

1. A spring mat having a weft and a warp, more particularly intended for the manufacture of resilient surfaces, comprising, in combination: a series of known spring elements, each of said elements consisting of a single wire of spring steel which is bent to present a series of mutually parallel spiral pairs, each pair consisting of two substantially coaxial spirals, namely a raising spiral and a descending spiral, a cloth or mesh work

connecting said elements together comprising said warp and, metal strips additionally respectively inserted through all the



spiral pairs of respective ones of said spring elements which, with at least some of said metal strips form said weft.

3,995,337

MATTRESS CONSTRUCTION

Gerald Gershaw, Garwood, N.J., assignor to Ther-A-Pedic Associates, Inc., Garwood, N.J.

Filed June 11, 1975, Ser. No. 585,815
Int. Cl.² A47C 23/00
U.S. Cl. 5—345 B 10 Claims

1. In an innerspring mattress construction of the type comprising an array of springs surrounded by a cover having a sidewall, and a handle mounted on the sidewall, the improvement wherein the handle has an opening therethrough; a grommet is mounted in the sidewall of the cover, said grommet extending through said handle opening and engaging the surrounding outer surface of the handle to retain it on said sidewall; and means for connecting said grommet to one of said springs so that lifting forces on the handle will be transferred to said spring, said connecting means comprising a stem portion extending through said grommet and adapted to be connected at its inner end to said spring, head means for engaging the outer end of said grommet to limit inward movement of said connecting means, and locking means adapted to engage the inner end of said grommet when said head means engages said outer end thereof to secure said connecting means to said grommet.

3,995,338

POLLEN TRAP WITH CLEANING GRID

Norbert M. Kauffeld, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 31, 1974, Ser. No. 519,727
Int. Cl.² A01K 47/06
U.S. Cl. 6—4 R 1 Claim

1. A pollen trap for collecting trash-free pollen from bees as they enter a bee hive, the trap comprising:

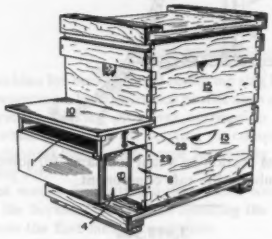
a. A compartmented, substantially rectangular box having an upper and a lower compartment, the box being dimensioned to fit onto a bee hive and consisting of:
   1. a substantially rectangular, hinged horizontal solid top, the back portion of which is extended to fit into the entrance of a bee hive,
   2. a substantially rectangular, vertically positioned solid front side,
   3. a substantially rectangular, horizontally positioned bottom side comprising a very finely screened plane,
   4. a substantially rectangular, vertically positioned screened back side,
   5. a substantially square, vertically positioned left side,
   6. a substantially square, vertically positioned right side having large apertures for receiving a pollen collecting drawer and a trash-collecting drawer,

b. a pollen-collecting drawer having a very fine screen floor,

c. a trash-collecting drawer having a very fine screen floor,

d. the lower compartment comsisting of a chamber for receiving the pollen-collecting drawer and the trash-collecting drawer,

e. the upper compartment providing the passageway for bees, being partitioned longitudinally to form an open



ended entry compartment, a screened middle compartment, and an exit compartment, which exit compartment opening directly into the entrance of the bee hive; the screened middle compartment comprising two vertically positioned removable medium gauge double screens, each of which is particularly nonaligned with respect to the other on the same frame and each of which in the same frame is spaced not more than about ⅛ of an inch so that an entering bee will be forced into a slow and circuitous path to divest the legs of the bee of pollen carried thereon, the pollen passing through the fine meshed floor of the upper compartment to gather in the pollen drawer the said exit chamber being provided with a wide mesh floor to collect the bodies of the dead bees as these are carried out of the hive, and

f. means for securing trap to a bee hive.

3,995,339

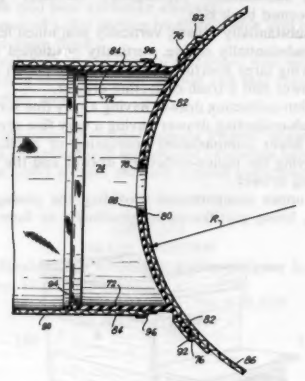
TRANSITION PIECE FOR USE IN INFLATABLE LIFE RAFTS

Michael M. Kaufman, 140 S. Park Drive, Massapequa Park, N.Y. 11732

Filed Aug. 25, 1975, Ser. No. 607,344
Int. Cl.² B63B 7/00
U.S. Cl. 9—2 A 5 Claims

1. A transition piece for use in the generally perpendicular joinder of the tubular components of inflatable life rafts comprising, a generally tubular body portion terminating at one extremity in a flange-less, tubular open end and terminating at the other extremity in an integral, generally circular attachment flange which extends generally perpendicularly thereof, said attachment flange including a flange portion which extends radially outward of the body portion and a flange portion which extends radially inward of the body portion so as to seal off at least a part of said other extremity, each of said

radially outward and said radially inward extending attachment flange portions being of generally concave configuration



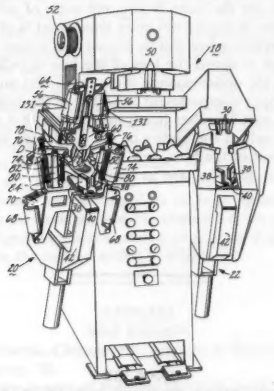
as seen in cross section to adapt the same for joinder to the exterior of a tubular life raft component.

3,995,340

SHOE LASTING MACHINES

Karl V. Becker, Boxford, Mass., assignor to USM Corporation, Boston, Mass.

Filed May 8, 1975, Ser. No. 575,836
Int. Cl.² A43D *21/12*
U.S. Cl. 12—8.1 **13 Claims**



1. A machine for lasting at least one side of a shoe, said machine comprising:

a support for locating and holding a last with an upper assembled thereon;

an arrangement of at least one gripper for tensioning the side margin of the upper heightwise of the bottom of said shoe;

a wiper member for lasting at least one side of said shoe including a resilient member having a compound curvature on its face contoured to conform to the edge and bottom of the side of said shoe on which it is to operate; and

means for bodily moving said wiper member inwardly at an angular disposition and widthwise of said shoe to press said tensioned upper first against the feather edge of the side of said shoe and thereafter to wrap the upper margin against the bottom of said shoe by a pivoting movement of said wiper member;

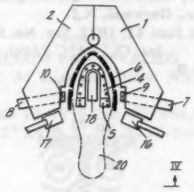
said wiper member locating the complementary shape of said shoe by first floatingly engaging the featherline near the ball zone of the shoe bottom, whereupon the bias in said wiper member forces the complementarily contoured surfaces to register causing the upper and insole to adhere with one another.

3,995,341

SHOE MACHINE

Gerhard Giebel, Neuenhain, Taunus, and Rolf Klein, Pirmasens, both of Germany, assignors to USM Corporation, Boston, Mass.

Filed Mar. 12, 1976, Ser. No. 666,236
Claims priority, application Germany, Mar. 14, 1975, 2511366; Mar. 14, 1975, 7508203[U]
Int. Cl.² A43D *21/00*
U.S. Cl. 12—10.1 **10 Claims**



1. A machine for cement lasting of shoe uppers and insoles on a last disposed on a shoe support, said lasting being performed in the toe point and the ball zones of said insole, said machine comprising:

a pair of obliquely forwardly directed ball zone wipers for lasting a portion of said upper therewith in a first stage;

a pair of fold distributors in a second stage for pushing over the lasting margin after withdrawal of said first stage wipers, said fold distributors having bent front edges such that they press resiliently against the edge of the shoe bottom in a generally normal angle of incidence and which generally overlap the zone of wiping of said ball wipers; and

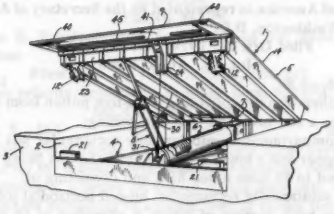
a lasting wiper comprising a third stage arranged between the shoe bottom and said fold distributors wherein problem creases are omitted from the shoe bottom, especially at the ball zone.

3,995,342

DOCKBOARD HAVING TRUCK BED SENSORS

Thomas J. Wiener, Brown Deer, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Jan. 26, 1976, Ser. No. 652,074
Int. Cl.² B65G *11/00*
U.S. Cl. 14—71.3 **17 Claims**



17. In a dockboard, a supporting structure, a ramp hinged at its rear edge to the supporting structure and movable between

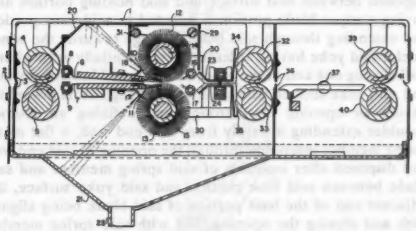
a generally horizontal cross traffic position and an upwardly inclined position, an extension lip hinged to the front edge of the ramp and movable between a downwardly hanging pendant position and an outwardly extending position, said lip when in the extended position adapted to engage a carrier located in front of the dock, lip lifting means operably connected to the lip for pivoting the lip from the pendant position to the extended position, said lip lifting means comprising an arm mounted for pivotal movement about the hinge axis of the lip and having an end engageable with said lip, whereby pivotal movement of said arm will act to move the lip from the pendant position to the extended position, support means hinged to the ramp and movable between a generally upright supporting position and a retracted position, means for biasing the support means toward the supporting position, means responsive to movement of the lip from the pendant position toward the extended position for moving said support means to the retracted position, carrier sensing means connected to said lip lifting arm, said sensing means being located on the underside of the lip and disposed to engage the carrier in conjunction with said lip, and holding means for holding the support means in the retracted position, said sensing means having a shorter length than the lip in a direction normal to said hinge axis so that the sensing means will lose contact with the carrier before the lip loses contact with the carrier as the carrier moves away from the dock whereby said lip lifting means and said sensing means will freely pivot downwardly with respect to the extended lip, downward movement of said sensing means and said lip lifting arm acting to release said holding means and enable the biasing means to move said support legs to the supporting position to restrain downward movement of the ramp when the carrier moves out of contact with the lip.

3,995,343

APPARATUS FOR PROCESSING A PRINTING PLATE

Ellwood J. Horner, Armonk, N.Y., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed Jan. 29, 1975, Ser. No. 545,188
Int. Cl.² A46B *13/04*; G03D *13/00*
U.S. Cl. 15—4 **7 Claims**



1. Apparatus for processing a printing plate comprising, at least one cleaning and scrubbing means including a rotatable brush means rotatably mounted on an axis parallel to the plane of a plate being processed, adapted to rotate in a direction opposite to the direction of travel of said plate through said apparatus and adapted to contact said plate as it travels through said apparatus, said cleaning and scrubbing means including deflector means mounted in contact with and in front of said brush means, with respect to the direction of travel of the plate through said apparatus, and adapted to clean solid debris from said brush means as it contacts said deflector means,

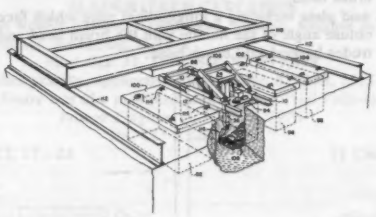
and processing fluid distributing means mounted adjacent to and behind said cleaning and scrubbing means, with respect to the direction of travel of said plate through said apparatus, and adapted to spray said processing fluid onto the bristles of said brush means just prior to the time said brush means rotates into contact with said plate.

3,995,344

LOW PROFILE SOAKING PIT MACHINE

Leo J. Meyers, Pittsburgh, Pa., assignor to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1975, Ser. No. 632,167
Int. Cl.² B08B *1/00*; E21C *9/00*
U.S. Cl. 15—104.07 **4 Claims**



1. A machine for breaking and removing slag from a soaking pit and presenting a low horizontal profile above the top of the pit to permit a soaking pit cover carriage to pass over the machine while resting on the soaking pit comprising:

a. a horizontal supporting frame for resting on top of the soaking pit;

b. a first means supporting a demolition tool downwardly from the horizontal frame for breaking the slag in the pit, wherein the first means comprises;

i. a turntable; and

ii. a boom assembly pivotally mounted on a bottom surface of the turntable and extending downwardly from the turntable to which the demolition tool is pivotally mounted and,

c. a second means coupling the first means to the horizontal supporting frame and raising the first means upwardly above the horizontal frame from a collapsed position, said collapsed position provides a low horizontal profile to permit the soaking pit cover carriage to pass over the soaking pit while the machine is resting on the soaking pit, the second means being capable of lowering the first means from the raised position back to the collapsed position, when the first means is raised above the frame the demolition tool is capable of breaking the slag in the pit, wherein the second means comprises:

i. a first boom member having one end pivotally connected to the horizontal supporting frame and having the turntable pivotally connected at another point along the boom; and

ii. a second boom member having one end pivotally connected to the supporting frame and having the turntable pivotally connected at another point along the boom.

3,995,345

CLEANING TOOLS

Stig Larsson, Box 5054, 581 10 Linkoping, Sweden

Filed June 12, 1975, Ser. No. 586,442
Int. Cl.² A47L *13/12*
U.S. Cl. 15—105 **8 Claims**

1. A tool designed for cleaning dry and wet dirt off pavements, shopfloors, sheds and the like, said tool comprising:

a. a brush having bristles and a head with a flat topside and a hole therethrough,

b. a handle disposed in said hole at an obtuse angle with respect to said flat topside,

c. said handle including a longitudinal shaft having a flange disposed at an angle with said shaft which angle corresponds to said angle between the handle and the flat topside,

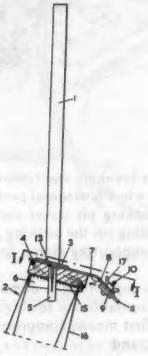
d. said handle including a first extension extending from the underside of such flange and coaxially with respect to said shaft,

e. said first extension projecting through said hole and having a portion protruding from the underside of said head,

f. said protruding portion including an axial slit extending therethrough and accommodating a wedge which fixes the brush head against the underside of said flange, and

g. a plate disposed between the flange and the topside of the brush head,

h. said plate including a longitudinal edge which faces the obtuse angle of the handle with the brush head and protrudes beyond said brush head,



i. said plate including a first opening therethrough having a portion corresponding to that of the hole in the brush head and another portion having a V-shaped groove configuration with edges that diverge to said first opening portion,

j. said handle including at least one wedge-shaped extension connecting along one side to said first extension and along a second side to the underside of the flange,

k. said wedge-shaped extension projecting from the flange being effective to fit with minimal penetration into said V-shaped groove configuration in said plate.

3,995,346

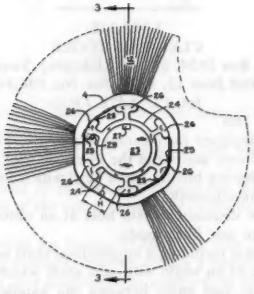
ROTARY BRUSH

John E. Grogan, Toledo, and Gerard A. Parseghian, Sylvania, both of Ohio, assignors to Power Brush Inc., Toledo, Ohio

Continuation of Ser. No. 470,230, May 15, 1974, abandoned. This application Apr. 4, 1975, Ser. No. 565,051

Int. Cl.² A46B *13/00, 15/00*

U.S. Cl. 15—182 **15 Claims**



1. A rotary brush comprising a central unitary cylinder, which is an extrusion, having a plurality of outwardly extending integral projections and an elongated brush member, having a channel-shaped backing, which is bent, biased, and wound around the projections of said central unitary cylinder, to such a degree that the backing of said elongated brush member, bites into and inwardly deforms said projections, the backing of said elongated brush member being non-arcuate in relation to the circumference of said projection and harder than said outwardly extending projections, wherein movement of the elongated brush member parellel to the axis of said unitary cylinder is prevented.

3,995,347

WINDSHIELD WIPER BLADE ASSEMBLY

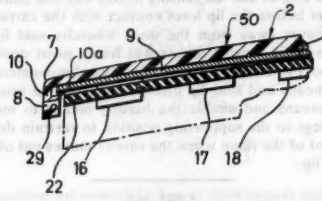
Alfred Kohler, Bietigheim-Bissingen, Germany, assignor to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Germany

Filed July 8, 1975, Ser. No. 594,062

Claims priority, application Germany, July 26, 1974, 2436046

Int. Cl.² B60S *1/04*

U.S. Cl. 15—250.42 **5 Claims**



1. A wiper blade assembly for vehicle windshields, comprising a blade yoke made of an elastic plastic material and having a surface on one side facing toward the windshield, blade support means carried by said yoke including a holding portion spaced from said yoke surface and having blade passage means therethrough, a wiper blade having a base portion disposed between said surface and said holding portion and having a wiper blade portion connected to said base portion and extending through said blade passage towards the windshield, said yoke having at least one substantially vertical end wall closing one end of the space between said holding portion and said yoke surface with an inturned flange at its lower end having an opening therethrough and defining an interior shoulder extending inwardly from said end wall, a flat metal spring member insertable through the opening in said end wall and disposed after insertion of said spring member and said blade between said base portion and said yoke surface, the adjacent end of the base portion of said blade being aligned with and closing the opening, and with said spring member overlying said shoulder for preventing said spring member from moving out of said yoke.

3,995,348

VACUUM CLEANER ATTACHMENT FOR ROTARY LAWNMOWERS

Allen A. Chernosky, 4015 Turnberry Circle, Houston, Tex. 77025

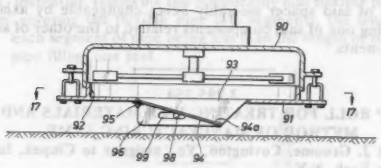
Filed Aug. 23, 1974, Ser. No. 499,830

Int. Cl.² A47L *9/00*

U.S. Cl. 15—328 **15 Claims**

1. A removable attachment for converting a rotary mower to a vacuum cleaner for picking up debris from a surface, such as a sidewalk, driveway, and the like, where the mower has a propeller type blade rotating in a housing having side walls, a discharge port, and an opening in the bottom thereof through which grass normally extends to be cut by the rotating blade, said attachment comprising a baffle member having an opening therein smaller than the opening in the housing for closing

off a portion of the bottom opening in the housing including a generally horizontal portion located below the opening in the housing and a substantially vertically extending portion between the generally horizontal portion and the side walls to position the horizontal portion closer to the surface to be vacuumed than are the side walls, said generally horizontal portion extending inwardly toward the axis of rotation of the blade past the ends of the blade to form a passageway between

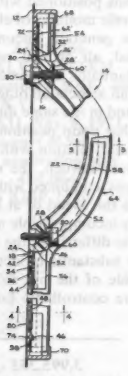


the horizontal portion and the surface being vacuumed extending to the opening in the member through which air will move generally horizontally toward the opening in the member and then upwardly into the housing and means for releasably attaching the member to the housing to restrict the flow of air between the member and the housing sufficiently to cause most of the air pulled into the housing by the blade to flow through the passageway.

3,995,349
DOOR HANDLE OF A HOUSEHOLD REFRIGERATOR

Edward H. Roberts, Jeffersontown, and Gordon V. Carter, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 24, 1975, Ser. No. 589,687
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² A47B 95/02
U.S. Cl. 16—125 **10 Claims**

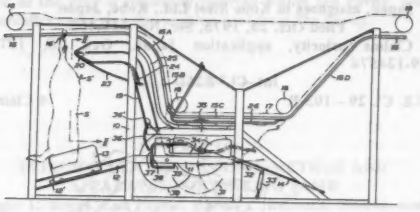


1. A door handle of a household refrigerator, comprising:
a first element having a first opening and a boss, said boss having an opening and an edge overlying a portion of the first opening;
a second element having inwardly extending edge portions and a protrustion of dimensions sufficient for insertion into the first opening for connecting the first and second elements;
a third element having a nut alignable with the boss opening and being of dimensions sufficient for extending over the second element protrusion and nesting in the first element; and
a cover extending over said elements and having locking tabs matable with the second element edge portions for connecting the cover to the second element.

3,995,350
METHOD AND AN APPARATUS FOR CLEAVING SLAUGHTERED CARCASSES

Martin Rudolf Ekstam, Kristianstad, Sweden, assignor to AB Stathmos, Jonkoping, Sweden

Filed Oct. 31, 1974, Ser. No. 519,599
Claims priority, application Sweden, Dec. 8, 1973, 7315152
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² A22B 5/20
U.S. Cl. 17—23 **11 Claims**

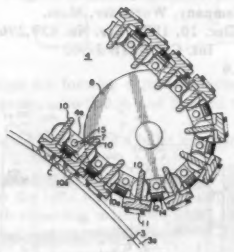


1. An improved method of cleaving slaughtered carcasses, the cleaving operation taking place essentially centrally by sawing through the spine while pulling the carcass forward lying on the back, the improvement consisting in that the two halves of the carcass obtained from the cleaving operation are moved apart and guided in such a way that the lower portion of each half is tipped inwardly while its upper portion is moved outwardly in order that the spine portion remaining in each carcass half may be pressed outwardly on the inside of the carcass half and become accessible for cutting by means of a saw while removing the smallest possible quantity of adjacent muscles above and below the spine portion.

3,995,351
FLAT SECTION IN CARDING MACHINE

Susumu Otani, Ohbu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed July 16, 1975, Ser. No. 596,242
Claims priority, application Japan, July 23, 1974, 49-86879
Int. Cl.² D01G 15/82
U.S. Cl. 19—102 **4 Claims**



1. A rotary flat in a carding machine, comprising:
a pair of endless conveying members supported for rotation in spaced relationship to each other above a cylinder of the carding machine;
a plurality of flat bars extending between and connected to

said conveying members with clearances between each adjacent pair of said flat bars;

a plurality of closing means, one each positioned between adjacent pairs of said flat bars, for closing the corresponding said clearances; and

each said closing means being connected adjacent opposite ends thereof to said conveying members, independently of said flat bars, at positions such that a longitudinal center axis of each said closing means substantially coincides with a longitudinal center axis of the corresponding clearance in all positions of each said closing means during rotation of said conveying members.

3,995,352

GEAR SHAVING CUTTER

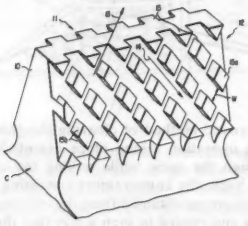
Michitaka Katsuta, and Kiyoaki Morimoto, both of Akashi, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Oct. 28, 1975, Ser. No. 626,462

Claims priority, application Japan, Oct. 28, 1974, 49-124574

Int. Cl.² B26D 1/12

U.S. Cl. 29—103 R 4 Claims



1. A gear shaving cutter comprising a rotatably body which is adapted to be rotated in meshing engagement with a gear to be finished so as to apply a shaving finish to said gear and which has a plurality of teeth disposed about the periphery thereof, each tooth of which includes two side cutting faces, the improvement comprising:

a first plurality of said cutting teeth of said cutter have formed upon a region of said cutting faces two groups of grooves disposed so as to extend in two directions which are different from each other,

said two groups of grooves having the same depth so as to define individual cutting land members therebetween.

3,995,353

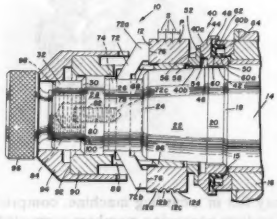
MULTI GROOVE ROLL MOUNTING MEANS

Norman A. Wilson, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Dec. 10, 1975, Ser. No. 639,296

Int. Cl.² B21B 27/02

U.S. Cl. 29—121.6 10 Claims



1. In a rolling mill, apparatus for mounting a multi groove work roll on the end section of a roll shaft in an operative position with one of the roll grooves in alignment with the mill pass line, said apparatus comprising: locating means on the roll shaft, a spacer assembly positioned between and engageable at opposite ends respectively with said locating means and with one end of a multi groove work roll which is axially received on the roll shaft, and retaining means engageable with the roll shaft for holding the work roll against said spacer assembly in a fixed position on said shaft, said spacer assembly including first and second components, with the overall axial length of said spacer assembly being changeable by axially reversing one of said components relative to the other of said components.

3,995,354

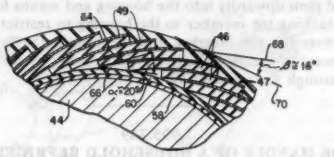
NIP ROLL FOR TREATING WEB MATERIALS AND METHOD OF MANUFACTURING SAME

Ernest J. Groome, Covington, Va., assignor to Clupak, Inc., New York, N.Y.

Filed May 30, 1975, Ser. No. 582,105

Int. Cl.² B21B 31/05

U.S. Cl. 29—130 15 Claims



1. A nip roll which comprises:

a. an inner substantially cylindrical member constructed of a substantially rigid material;

b. a cover member of a generally incompressible substantially resilient material positioned about said inner member and secured to the outer surface portions thereof; and

c. reinforcing means positioned within said cover member and having a tensile modulus of elasticity greater than the modulus of the generally incompressible substantially resilient material, all of said reinforcing means being sloped at substantially the same generally acute angle with respect to an associated outer surface portion of the inner member and in the same direction around the inner member such that upon positioning the roll in adjacent engaged rotational relation with a mating roll so as to create a nip therebetween, the sloped direction of said reinforcing means, combined with the greater modulus of elasticity causes the speed of at least surface portions of the substantially incompressible material on the incoming side of the nip to differ from the speed of at least surface portions of the substantially incompressible material on the outgoing side of the nip so as to provide resulting forces which are controllable for treating web materials and the like.

3,995,355

LAYING OF FLEXIBLE PIPE

Robert C. Sneed, and Joseph C. Young, both of Odessa, Tex., assignors to Fas-Line Sales & Rentals, Inc., Odessa, Tex.

Filed June 30, 1975, Ser. No. 591,540

Int. Cl.² B65H 49/00, 69/08; B65G 67/12, 67/24

U.S. Cl. 29—157 R 4 Claims

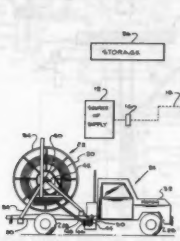
1. The method of temporarily connecting at a field site a supply terminal of a source of supply of fluid under pressure to a use terminal comprising:

a. placing flexible plastic pipe upon a vehicle reel mounted upon a wheeled vehicle.

b. connecting the flexible pipe for fluid transmission to one of said terminals,

c. moving the vehicle, thus

d. unreeling the flexible pipe from the reel,
e. connecting additional flexible pipe on a reel on the vehicle for fluid transmission to that already laid, thereafter,
f. moving the vehicle, thus
g. laying additional pipe,
h. continuing the steps of d), e), and f) until the other terminal is reached,
j. connecting the flexible pipe for fluid transmission to said other terminal;
k. thereafter, retrieving the temporarily laid flexible pipe by
m. severing the flexible pipe into segments, the length of each segment of pipe being less than the length of flexible pipe filling one reel,

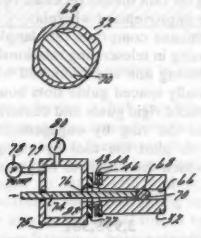


n. attaching a segment of flexible pipe to the vehicle reel,
o. reeling the attached segment onto the vehicle reel,
p. moving the vehicle to another segment of flexible pipe, and
q. attaching said another segment to the segment of pipe already on the reel, and
r. reeling said another segment onto the vehicle reel,
s. continuing the steps p), q), and r), until the reel is full,
t. unreeling the pipe from the reel, and
u. continuing the steps n), o), p), q), r), s), and t), until all the segmented pipe is retrieved.

3,995,356
VALVE SYSTEM

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Division of Ser. No. 195,631, Nov. 4, 1971, Pat. No. 3,805,522, which is a continuation-in-part of Ser. No. 126,182, March 19, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 450,004
Int. Cl.² B23P *15/00*, *19/02*
U.S. Cl. 29—157 R **9 Claims**

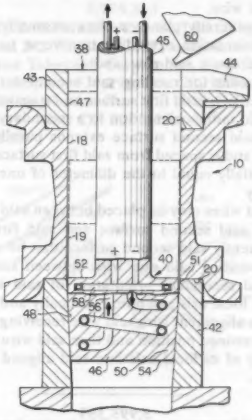


1. The method of establishing a uniform effective orifice size in mass-produced fluid dynamic controlled devices which comprises the steps of forming a tapered elongated cavity in an external element, forming a cylindrical plug element having a major cross sectional comfiguration smaller than at least a first portion of the tapered cavity and larger than a second portion of the tapered cavity, forming a longitudinal discontinuity in one of the abutting faces of the cavity and the plug with the plug having an abutting face of substantially less axial length than that of the cavity, positioning the plug in said first portion of the cavity, placing a pushing tool in engagement with the plug and forcefully moving the tool to progressively forcefully insert the plug into the cavity to progressively physically distort one of the elements as a result of that progressive forceful insertion to effectively reduce the cross sectional size of that longitudinal discontinuity progressively during the progressive insertion, the angle of taper and materials used being such that said forceful insertion will cause the plug to become frictionally fixed in place in the cavity without the application of continued force, said plug element being imperforate so that said longitudinal discontinuity on said abutting face constitutes the sole orifice for communicating fluid longitudinally of said plug element, calibrating the size of the orifice as the plug is forcefully inserted within the cavity, and thereafter removing the pushing tool from the cavity.

3,995,357
INTEGRALLY CAST BEARING, METHOD AND APPARATUS FOR MAKING SAME

Roger L. Boggs, East Peoria; Harold L. Reinsma, Dunlap, and Glenn R. Gobble, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 16, 1974, Ser. No. 532,762
Int. Cl.² B21D *53/10*
U.S. Cl. 29—149.5 R **8 Claims**



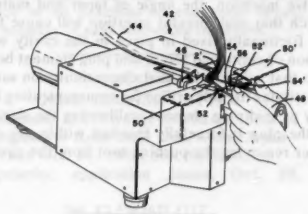
1. A process for forming a part including a bore with a bearing integrally solidified in and bonded thereto, comprising:
hot machining a bore into a billet in a non-oxidizing atmosphere;
introducing molten bearing material about a mandrel positioned in the bore with the bore being positioned generally vertically while maintaining the billet, the mandrel and the bearing material in the non-oxidizing atmosphere; and
drawing the mandrel upwardly from the bore while cooling an end of the mandrel which exits the bore last sufficiently to progressively solidify the bearing material adjacent said end of said mandrel as the mandrel is drawn through the material and out of the bore and integrally solidify the bearing material in and bond it to the bore.

3,995,358

APPLICATOR TOOL FOR MULTI-CONDUCTOR CONNECTOR

Robert Alvin Long; William Roderick Over, both of Harrisburg, and Willard Allen Smith, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 10, 1976, Ser. No. 657,015
Int. Cl.² H01R 43/04
U.S. Cl. 29—203 MW 16 Claims



1. An apparatus for inserting wires into terminals located in a horizontally extending row by moving each of said wires laterally of its local axis into a wire receiving portion of one of said terminals, said apparatus comprising,

a generally planar, vertically extending first surface,

terminal positioning means for positioning said row of terminals transverse to said vertically extending surface, with one of said wire receiving portions in a predetermined position spaced from the plane of said first surface by a distance approximately equal to and greater than the radius of one of said wires, and less than the diameter of said one wire,

a second generally planar surface, normally located in an initial orientation extending transverse to said first surface and above said row, and

rotating means for rotating said second surface about an axis parallel to said first surface and transverse to said row from said initial orientation to a secondary orientation in which said second surface extends parallel to said first surface and is spaced from said first surface by a distance substantially equal to the diameter of one of said wires, whereby

one of said wires may be placed between said initial orientation of said second surface and said first surface and subsequently said second surface can be rotated to precisely position said one wire between said first surface and said secondary orientation of said second surface with its local axis extending vertically and with said wire being in alignment with said wire receiving portion in said predetermined position and then said wire may be moved laterally of its local axis into said aligned wire receiving portion.

3,995,359

QUILTING MACHINE

Arthur J. Randolph, P.O. Box 1541, Santa Rosa, Calif. 95405

Filed Sept. 24, 1975, Ser. No. 616,199
Int. Cl.² B23Q 7/10
U.S. Cl. 29—211 R 8 Claims

1. A quilting machine for inserting a two-part quilting button having a male and female part in a workpiece comprising

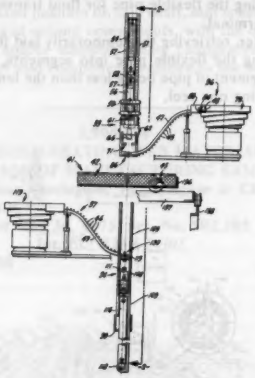
a multiple displacement male button holder adapted to grip a male button part,

a male button part feed mechanism including a slide bar movable into and out of alignment with said male button holder for gripping of a male button part from the feed mechanism by vertical displacement of a portion of said male button holder,

a multiple displacement female button holder disposed in axially aligned relation to said male button holder and having a needle extending axially therefrom,

a female button part feed mechanism including a lower slide bar movable into and out of alignment with said needle and retaining a female button part thereon upon displacement of the female button holder to drive the needle through a female button part,

a workpiece holder disposed between said holders,



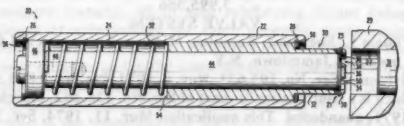
means displacing said male and female button holders axially toward each other to pierce a workpiece disposed therebetween by said needle and female button part followed by insertion of said male button part in said female button part as said needle is retracted.

3,995,360

SELF-LOCKING RETAINING RING ASSEMBLY TOOL

Melvin Millheiser, North Bellmore, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed Nov. 11, 1975, Ser. No. 631,192
Int. Cl.² B23P 19/08
U.S. Cl. 29—229 27 Claims



18. In an assembly tool for closed, self-locking retaining rings including extensible and retractable centering means for centering the ring on ram means recessed relative to the centering means, the improvement wherein:

said centering means comprises tubular sleeve means carried by a housing in telescoping relationship with said ram means and having one end fashioned with a plurality of circumferentially spaced guide slots bounded by circumferentially spaced rigid guide and centering fingers operable to center the ring by engagement with the body thereof and to pilot the tool by engagement with the member to which the ring is to be assembled.

3,995,361

PRESTRESSED DOUBLE ACTION FORCING PRESS

Dennis M. Scheller; Lanny R. Sanner, and Granville Woolman, all of Granite Falls, Minn., assignors to Victor Fluid Power, Eden Prairie, Minn.

Filed Oct. 20, 1975, Ser. No. 624,768
Int. Cl.² B23P 19/02
U.S. Cl. 29—251 12 Claims

1. In a hydraulic forcing press for press fitting first and

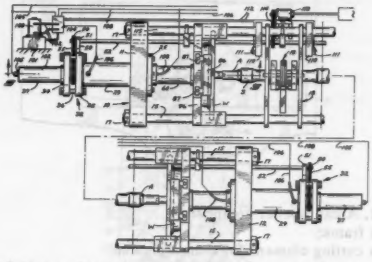
second members onto coaxially aligned seats on opposite sides of a central member,

a. a frame having spaced standards rigidly interconnected by parallel tie rods,

b. said standards respectively supporting cylinder means in axial alignment with each other on an axis parallel to and between said tie rods,

c. each of said cylinder means including first and second rams with said first rams being axially aligned and said second rams being axially aligned,

d. first hydraulic means for moving the first rams inwardly



toward each other against the opposite sides of the central member to hold said member immovably therebetween and prestress the tie rods and other frame members,

e. means on the frame for supporting said first and second members adjacent to the seats on the opposite sides of the central member and between the central member and said second rams, and

f. a second hydraulic means for moving the second rams inwardly against said first and second members to force them onto the seats on the opposite sides of the central member.

3,995,362

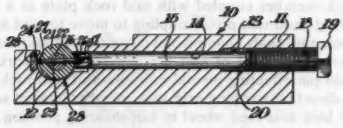
TAPER PIN REMOVER

Wayne C. Hall, 15 Hillside Ave., Hastings-on-Hudson, N.Y. 10706

Filed Mar. 25, 1975, Ser. No. 561,932

Int. Cl.² B23P *17/04*

U.S. Cl. 29—257 **6 Claims**



1. A taper pin remover comprising in combination:

a. a housing,

1. said housing having a hub receiving end formed to receive and engage a circumferential portion of the hub and taper pin passing therethrough to be removed, said hub receiving end having a hardened nonresilient portion arranged to mate with and urge longitudinally against a normally small protruding tip of said taper pin to provide axial longitudinal forces to said taper pin,

2. said housing having a bore extending longitudinally from the end opposite the hub receiving end and into the hub engaging end, at least a portion of the bore being threaded and formed to receive an operatively associated screw member and a portion of the bore between the threaded portion and the hub engaging end is operatively associated with a slidably mounted drive pin;

b. a drive pin slidably mounted within the bore of the housing having a hub urging end cut away and formed to mate with said hub and taper pin to urge pressure against the hub towards the hardened nonresilient portion at a point closely adjacent to the head of the taper pin without urging the head of the taper pin, said drive pin having a cavity cut into one side at the hub urging end formed and shaped to receive a protruding head of the taper pin with said cavity being larger than said head of the taper pin to allow for movement of said taper pin within said cavity, said drive pin and taper pin being in substantial parallel alignment;

c. a screw member threadably mounted within the threaded portion of the bore of the housing that is screwable into and out of said threaded bore of the housing, and which has an inward end operatively associated with the drive pin to urge the drive pin against the hub at a location closely adjacent to the head of the taper pin to urge the opposite small protruding tip of the taper pin against the hub receiving end of the housing to force the taper pin backwardly out of its tight engagement with said hub and shaft passing therethrough.

3,995,363

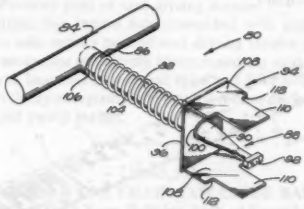
CONNECTOR MEMBER AND EXTRACTION TOOL

Jose M. Medina, Jr., Whittier, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 535,290, Dec. 23, 1974, Pat. No. 3,951,514. This application Nov. 17, 1975, Ser. No. 632,232

Int. Cl.² B25B *27/14*

U.S. Cl. 29—280 **8 Claims**



1. A tool for releasing and removing a support member from the front end of a connector shell containing a resilient support member-retention finger extending inwardly and rearwardly from the wall of said shell, with an elongated slot opening at the front face of said support member comprising:

a shaft having a forward end and a rear end;

a handle adjacent to said rear end and a transversely extending elongated arm fixed to said shaft adjacent to said forward end of said shaft, said forward end and arm being dimensioned to slide through said slot;

an element mounted on said shaft adjacent to said forward end, said element being rotatable about the axis of said shaft; and

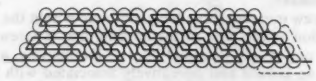
said element having a forwardly extending leg generally parallel to and spaced from said shaft, said leg terminating in a forward free end, the distance between said leg and arm corresponding to the distance between said slot and retention finger.

3,995,364

METHOD FOR MANUFACTURING A TUBULAR-SHAPED MULTILAYER COIL FOR ELECTRICAL MACHINES

Henry Kristiansen, Sachseln, Switzerland, assignor to Interelectric Aktiengesellschaft, Sachseln, Switzerland

Continuation-in-part of Ser. No. 397,265, Sept. 14, 1973, abandoned. This application May 30, 1975, Ser. No. 582,195
Int. Cl.² H02K 15/02
U.S. Cl. 29—598 6 Claims



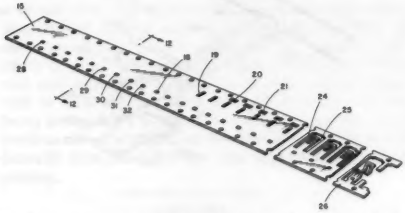
1. The method of winding a tubular-shaped multilayer coil used as an ironless rotor in electrical motors, comprising the steps of winding at least one insulated wire around a cylindrical form having a rhomboidal cross-section, providing taps while winding said wire on said form after a number of windings corresponding to an integral fraction of the desired total number of windings on said form have been completed, removing the windings from said form, deforming said windings to a bandlike structure, bending said structure to a tubular-shaped coil and joining the ends of said coil, the wire being wound on said form in a multilayer formation by alternating the direction of axial advancement of said windings at least twice between adjacent terminals of said cylindrical winding.

3,995,365

METHOD OF FORMING ELECTRICAL CONTACTS

Thomas J. Repplinger, Cary, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Jan. 13, 1975, Ser. No. 540,387
Int. Cl.² H01R 9/22
U.S. Cl. 29—630 C 5 Claims



1. A method of forming electrical components comprising the steps of:

a. intermittently moving a flat strip of material in a first plane through a punch press past a plurality of stations in the punch press,

b. forming an opening in the strip with the punch press at one of the stations,

c. moving a round metal wire into the punch press in a second plane spaced from and generally parallel to the first plane,

d. punching an axially extending cylindrical segment from the metal wire through the punch press in a direction perpendicular to the plane of the strip and into an opening in the strip at another station so that the axis of the cylindrical segment lies in the plane of the strip, and

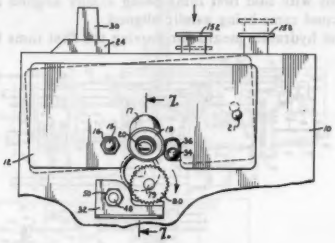
e. forming the punched segment of wire into an electrical contact at another station of the punch press.

3,995,366

PUSH BUTTON OPERATED CAN OPENER

Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Jan. 19, 1976, Ser. No. 650,500
Int. Cl.² B67B 7/38
U.S. Cl. 30—4 R 20 Claims



1. A can opener comprising:

a frame;

a cutting element for shearing a can;

means for mounting said cutting element on said frame;

a rotatable shaft;

a feed wheel carried on said shaft to feed a can with respect to said cutting element;

a carrier member supporting said shaft for rotation, said carrier member being supported for pivotal movement on said frame at a location offset from said shaft to carry said feed wheel toward and away from said cutting element between an upper can shearing position and a lower can release position;

a motor;

means drivingly coupling said motor to said shaft;

a pin coupled with said shaft outwardly of the axis thereof for orbital movement about the shaft axis;

a rock plate supported on said frame for pivotal movement about a pivot coupling;

a pawl coupled to said rock plate at a location offset from said pivot coupling, said pawl including a pin engaging portion engageable with said pin to pivot said carrier member in a direction to locate said feed wheel in can shearing position;

means for operating said pawl to position said pin engaging portion thereof in engagement with said pin; and

a lock member coupled with said rock plate at a location offset from said pivot coupling to move toward and away from said shaft upon pivotal movement of said rock plate, the engagement of said pin engaging pawl portion with said pin effecting pivotal movement of said rock plate in a direction carrying said lock member against said shaft to lock said feed wheel in can shearing position.

3,995,367

BEARING SEPARATOR AND SEALING SYSTEM FOR ROCK BIT

Samuel Lee Penny, Lancaster, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1976, Ser. No. 662,489
Int. Cl.² F16C 19/00
U.S. Cl. 308—8.2 5 Claims

1. A rotary rock bit, comprising:

a rock bit body;

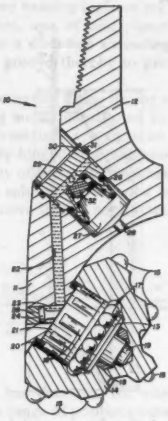
at least one bearing pin extending from said rock bit body, said bearing pin having an outer end positioned away from said rock bit body;

a cone cutter member rotatably positioned over said bearing pin, said cutter member having a cone mouth positioned proximate said rock bit body;

bearing means between said cutter member and bearing pin

for promoting rotation of said cutter member, said bearing means including a plurality of cylindrical rollers positioned around said bearing pin between said bearing pin and said cutter member;

a spacer unit positioned around said bearing pin between said cutter member and said bearing pin, said spacer unit including an annular body with a plurality of separator



elements cantilevered from said annular body extending toward said outer end of said bearing pin, said cylindrical rollers alternately positioned between said separator elements and said annular body located in the cone mouth of said cutter member; and

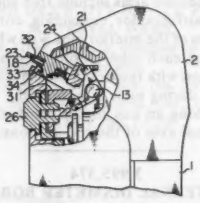
a seal member located in the cone mouth of said cutter member between said rock bit body and said annular body of said spacer unit.

3,995,368

ELECTRIC DRY SHAVER WITH TRIMMER

Norio Yamada, and Yoshiro Kawano, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed June 13, 1975, Ser. No. 586,757
Claims priority, application Japan, June 15, 1974, 49-68538
Int. Cl.² B26B *19/10*
U.S. Cl. 30—34.1 **6 Claims**



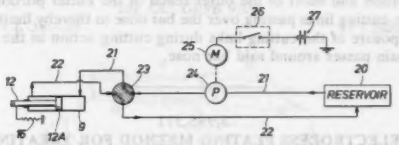
1. An electric dry shaver comprising a main shaving blade assembly of an outer shearing blade provided in a frame of shaver body and an inner cutter blade provided slidably in contact with inner surface of said outer shearing blade, a trimmer blade assembly of a comb blade fixed to the shaver body and a clipper cutter blade slidable along said comb blade, a driving means for providing a reciprocating motion to said cutter blade of main shaving blade assembly, a coupling means rotatably pivoted to said driving means for moving always together with the driving means, and a handle fitted to the shaver body so as to be movable between engaging and disengaging positons with said coupling means, said coupling means being rotated to engage with said clipper cutter blade of the trimmer blade assembly only when said handle is moved into said engaging position with the coupling means so that the coupling means will transmit the reciprocating motion of the driving means to the clipper cutter blade.

3,995,369

CATTLE DE-HORNING APPARATUS

Qunion R. Duff, Rte. 4, Box 135, Livingston, Tex. 77351

Filed Aug. 28, 1975, Ser. No. 608,649
Int. Cl.² B26B *15/00*
U.S. Cl. 30—228 **2 Claims**



1. Apparatus for de-horning cattle and the like, comprising:

a frame member having a blade portion fixedly supported therein,

a movable knife member slidably supported in said frame member,

fluid-actuated driving means having an extend port and a retract port for driving said knife member into shearing engagement with said blade portion of said frame member,

reservoir means for supporting a quantity of fluid under ambient pressure,

selectively actuated pump means having an intake port and an outlet port,

first line means interconnected between said reservoir means and said intake port of said pump means,

second line means interconnected with and extending from said outlet port of said pump means,

third line means interconnected with and extending from said reservoir means,

fourth line means interconnected with and extending from said extend port of said driving means,

fifth drain line means interconnected with and extending from said retract port of said driving means, and

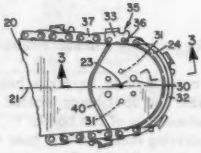
valve means for selectively interconnecting said second and fourth line means and said third and fifth line means for selectively energizing said driving means during actuation of said pump means.

3,995,370

GUARD FOR CHAIN SAW GUIDE BAR

Patrice Allard, and Yvon Dallaire, both of Kapuskasing, Canada, assignors to Omark Industries, Inc., Portland, Oreg.

Filed June 6, 1975, Ser. No. 584,575
Int. Cl.² B27B *17/02*
U.S. Cl. 30—382 **1 Claim**



1. For a chain saw, the combination which comprises; a guide bar and a length of saw chain entrained thereon and

adapted to be driven by the chain saw around the guide bar, said saw chain including center links and side links with certan side links being cutting links having a base portion from which extends a cutter portion and a depth gauge portion, said guide bar including a main bar portion having top and bottom edges and supporting means for supporting said saw chain along said edges in a manner whereby the cutter portion and depth gauge portion of the cutting links are fully exposed during cutting action, and guide means forming the nose of the guide bar for guiding the saw chain around the end of the bar from one edge to the other edge, the improvement which comprises a thin flat rigid rail fixed to the guide bar and positioned at the nose of the bar, said rail having an outer end that extends outwardly of the guide bar at the bar nose only to a point beyond the base portion and short of the outer reach of the cutter portion of the cutting links passing over the bar nose to thereby limit the exposure of the cutting links during cutting action as the saw chain passes around said bar nose.

3,995,371

ELECTROLESS PLATING METHOD FOR TREATING TEETH

Thomas J. O'Keefe, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Oct. 10, 1974, Ser. No. 513,654
Int. Cl.² A61K 5/02; C23C 3/02
U.S. Cl. 32—15 **28 Claims**

1. A dental procedure for providing a thin adherent substantially continuous metallic layer over a surface of a tooth comprising the steps of:

contacting a surface of a tooth in a patient's mouth with an aqueous plating mixture containing a water-soluble salt of a metal selected from the group consisting of gold, silver, copper, nickel, platinum, palladium and tin and a reducing agent for the metal ions of said salt; and

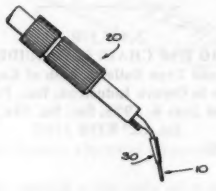
maintaining said mixture in contact with said surface for a time sufficient for an electrolessly deposited metallic layer to form thereon.

3,995,372

METHOD AND APPARATUS FOR SECURING A RETENTION PIN TO A TOOTH

Joseph A. Rapuano, 813 Morningside Road, Ridgewood, N.J. 07450

Filed Jan. 14, 1975, Ser. No. 540,770
Int. Cl.² A61C 3/00
U.S. Cl. 32--40 R **7 Claims**



1. A device for inserting a dental retention pin into a tooth comprising:

A generally conical body having a base and a truncated apex, the base and apex being located at opposite ends of the longitudinal axis of the body;

Ultrasonic receiving means in said base wherein the base is connectible by a friction fit to a source of ultrasonic vibrations;

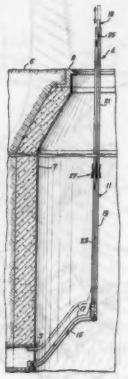
Dental retention pin gripping means in said truncated apex of sufficient diameter to grip a dental retention pin during the insertion of the pin into a tooth.

3,995,373

MEASURING DEVICE FOR ASCERTAINING PIPE DIAMETER AND DEPTH LOCATION

Dorsey R. Brumbelow, 12995 Bethany Road, Alpharetta, Ga. 30201

Filed Sept. 30, 1975, Ser. No. 618,166
Int. Cl.² G01B 5/02, 5/12
U.S. Cl. 33—143 M **10 Claims**



1. A measuring device for ascertaining the diameter and depth of a remotely located pipe, which device comprises:

a. a stationary rod section provided with a longitudinal channel;

b. a movable rod section slidably received within the longitudinal channel for extension and retraction with respect to the stationary rod section;

c. a first elongated arm having a curvilinear configuration carried by an end of the stationary rod section and extending outwardly and downwardly therefrom when the stationary rod section is oriented vertically with the first arm being disposed at the lower end thereof;

d. a second elongated arm carried by the corresponding end of the movable rod section and having a curvilinear configuration corresponding to the curvilinear configuration of the first elongated arm such that the first and second arms may be disposed together in a substantially parallel contiguous relationship when the movable rod section is substantially fully retracted within the stationary rod section; and

e. the first and second arms include free ends having a pair of opposed surfaces for contacting corresponding opposed portions of the interior pipe wall when the arms are separated from each other during extension of the movable rod section with respect to the stationary rod section and wherein, during such extension, the free ends of the arms move along an axis that is substantially parallel to the longitudinal axes of the rod sections.

3,995,374

SMALL INTERNAL DIAMETER BORE GAUGE

James C. Fisk, G-3219 E. Bristol, Burton, Mich. 48529

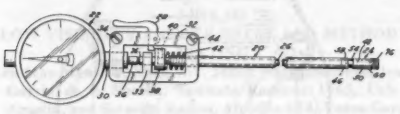
Filed Aug. 26, 1975, Ser. No. 607,756
Int. Cl.² G01C 5/12
U.S. Cl. 33—178 R **7 Claims**

1. An internal measuring gauge comprising, in combination; an elongated probe having at least one longitudinally extending work contacting finger hinged to the probe for lateral movement away from and return toward the probe, said finger having a narrow rib on the underside thereof extending transversely of the finger and parallel to its hinge axis and terminating in an inwardly facing planar bearing surface inclined to the longitudinal dimension of the probe;

a plunger extending longitudinally of the probe and being movable longitudinally thereof; and

a wedge cam carried by the plunger and movable therewith, said wedge cam having an outwardly facing planar bearing surface inclined to the longitudinal dimension of the probe at substantially the same angle as the planar bearing surface of the rib of the finger and so presented to the latter that the two bearing surfaces are in surface contact with one another, one of said planar bearing surfaces being divided in a direction extending longitudinally of the finger by a groove thereby to provide spaced apart bearing areas.

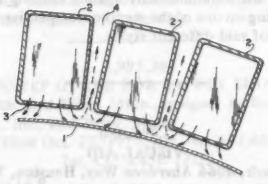
4. In an internal measuring gauge having an elongated probe member and gauging means constituted by a plurality of fingers equally circumferentially spaced apart from one another and similarly flexually hinged at a common end to the probe member, said plurality of fingers having their respective opposite ends outwardly spherically rounded to form a gauging surface and free to move from a contracted position occupying a circular space less than that for which the measuring gauge is designed to a range of positions outwardly beyond the external surface of the probe member for which the measuring gauge is designed to measure, and a wedge cam shiftable axially of the probe member and provided with a plurality of correspondingly inclined planar bearing surfaces equally circumferentially spaced apart around the axis of the probe member and located in individually confronting relationship to the undersides of the free ends of the plurality of fingers, wherein the improvement comprises a narrow rib projecting from the underside of the free end of each finger in transverse relation thereto and forming a narrow planar bearing face opposing the confronting one of the planar bearing surfaces of the wedge cam, the planar bearing face of each said narrow rib intersecting the axis of the spherically rounded gauging surface of its finger which perpendicularly intersects the axis of the probe member and further being inclined at the same angle as the opposing inclined planar surface of the wedge cam against which it bears.



3,995,375
DISCHARGE AND DRAW-OFF DEVICE FOR DRIERS OF MATERIAL WEBS

Alfred Weinmann, Graz, Austria, assignor to Maschinenfabrik Andritz Aktiengesellschaft, Austria

Filed Sept. 24, 1973, Ser. No. 399,966
Claims priority, application Austria, Oct. 31, 1972, 9247/72
Int. Cl.² F26B *13/00*
U.S. Cl. 34—155 3 Claims



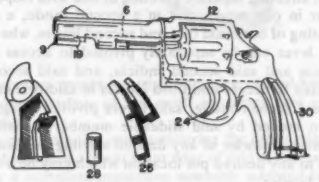
1. In a discharge and draw-off device for driers of material webs including nozzle casings mounted transversely over the path of a web to be dried, and having discharge apertures in said casings for discharging a drying medium and interstices between said casings for drawing-off said medium,

the improvement comprising a substantially V-shaped formation of rows of the discharge apertures, whereby a double whirl is produced whose flow spiral increases in the direction toward the draw-off openings.

3,995,376
SMALL ARMS LASER TRAINING DEVICE

Joe W. Kimble, Vienna, Va.; Duane A. Burchick, Greenbelt, Md., and Edsel E. Dotson, Alexandria, Va., assignors to Cerberonics, Inc., Falls Church, Va.

Filed Apr. 3, 1975, Ser. No. 564,861
Int. Cl.² G09B *9/00*
U.S. Cl. 35—25 11 Claims

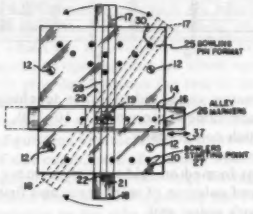


1. A pistol of a standard type comprising a frame, a firing assembly including a trigger, a barrel, sights, a handle and butt grips mounted to the handle, said butt grips being modified to contain switch means, battery means, an electrical pulse circuit module contained within said handle, a laser optics module comprising a laser and lens means mounted to the barrel of the pistol remote from said electrical pulse circuit module, connecting circuitry means mounted on said pistol frame and barrel connecting said electrical pulse circuit module with said laser optic module, said switch means, battery means, and electrical pulse circuit module being adapted to be removably mounted and housed within the handle of the pistol and enclosed by the butt grips, said switch means, battery means, electrical pulse circuit module and laser optics module being electrically connected so that the laser will emit a low power pulse of coherent light in a direction parallel to the axis of the bore of said barrel each time said trigger is pulled, said modified pistol being constructed and selectively operated for a plurality of modes of use including laser dry fire, blank ammunition and live ammunition.

3,995,377
UNIVERSAL SPOT BOWLING AID

John Grollmusz, 30 Hudson Road, East Brunswick, N.J. 08816

Filed Feb. 13, 1976, Ser. No. 658,337
Int. Cl.² G09B *9/00*
U.S. Cl. 35—29 F 8 Claims



1. A bowling aid, comprising:

a. first and second planar members, each member having a lateral channel on a surface thereof, wherein one of said

surfaces of said first or second planar members includes first indicia thereon indicative of the formation of ten bowling pins, and a second series of indicia indicative of alley markers, and a third set of indicia indicative of conventional starting markers used by a bowler to commence his approach towards the bowling pins,

b. means for positioning said members one above the other with said channels positioned in congruency and facing each other to form a lateral central channel,

c. a slideable member positioned within said central channel and adapted to slide laterally therein,

d. first and second lever members pivotally secured to said slideable member and extending relatively transverse thereto with the ends of each of said levers furtherest removed from said pivot point extending from opposite ends of said planar members, said lever members as coupled, enabling separate pivoting of one with respect to the other in one mode, and in a second mode, a common pivoting of both said first and second levers, whereby said first lever can be separately pivoted to access said first indicia and said second indicia, and said second lever pivoted to access said third indicia in said first mode, and in said second mode, said levers pivoted integrally and when moved by said slideable member, capable of informing a bowler of any desired starting position in relation to any desired pin location which may be a target for said bowler.

3,995,378

MATHEMATICS VISUAL TEACHING AID

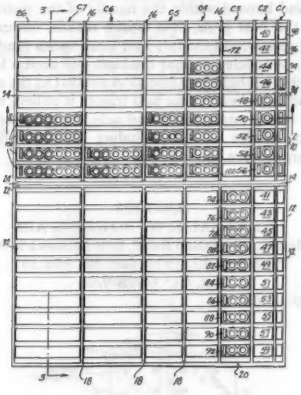
Eula K. Darnell, 307 Baldwin, West Helena, Ark. 72390

Continuation-in-part of Ser. No. 488,182, July 12, 1974, Pat. No. 3,908,287. This application Sept. 26, 1975, Ser. No. 617,107

The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.

Int. Cl.² G09B *19/02*

U.S. Cl. 35—31 B **14 Claims**



1. A mathematics visual aid useful in teaching the importance of the place-value components 1, 10, 100, ... 10^n (n=0, 1, 2 ...), which comprises:

a support member;

divider means formed on said support member for defining a plurality of columns of work areas and first and second rows of work areas; and

a plurality of sets of workpieces, the number of said sets corresponding to the number of said columns of work areas, a unique set of workpieces rotatably mounted within each of said columns, all the workpieces within each of said sets sharing a common physical configuration which differs from the common physical configuration shared by the workpieces in each of the other sets.

3,995,379

KNITTING

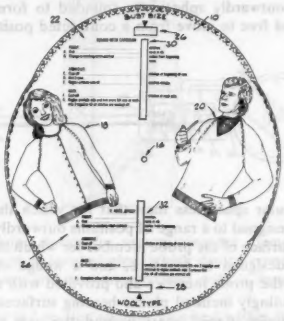
Fred Willi Karl Werber, P.O. Box 1659, Johannesburg, Transvaal, South Africa

Continuation of Ser. No. 472,585, May 23, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,491

Claims priority, application South Africa, Apr. 29, 1974, 74/2681

Int. Cl.² G09B *19/20, 1/20*

U.S. Cl. 35—15 **3 Claims**



1. A device for determining the number of stitches and associated information required in the knitting of at least two garments of the same bust size but of different respective styles, the device including two relatively movable members, one of the members having markings representing different bust sizes, markings representing different knitting thread types, and a plurality of rows of figures, and the other member having indicated thereon a bust size datum marking, a knitting thread type datum marking, and a plurality of knitting instructions associated respectively with said rows of figures, some of the rows of figures representing numbers of stitches and other rows representing associated information, and said other member being movable with respect to said one member to position any selected one of said markings representing different bust sizes adjacent said bust size datum marking and any selected one of said markings representing different knitting thread types adjacent said knitting thread type datum marking so that when the bust size marking representing a selected bust size and the knitting thread type marking representing a selected thread type are adjacent to said bust size datum marking and said knitting thread type datum marking respectively, numbers of stitches and associated information appropriate for knitting at least two garments of the selected bust size but of different respective styles from the selected thread type may be read off simultaneously against knitting instructions, and there being on one of the members respective illustrations of garments of said different styles.

3,995,380

VISUAL AID

Nadim E. Nasir, 4066 Aberdeen Way, Houston, Tex. 77025

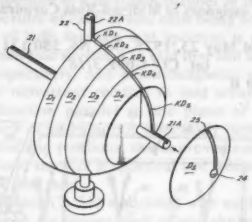
Filed Aug. 20, 1975, Ser. No. 606,294

Int. Cl.² G09B *23/04*

U.S. Cl. 35—34 **9 Claims**

1. A visual aid for use in teaching applications in integral calculus, comprising support means defining X and Y axes,

and a plurality of segmental shapes mounted on the support means to describe a geometrical shape which is generated by



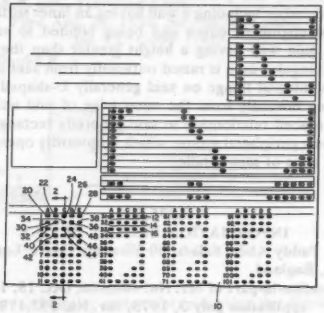
the revolution of an area bounded by a given curve about one of said axes.

3,995,381

LOW VISIBILITY ANSWER SHEET AND METHOD OF TESTING

Ken Max Manfred, Volta 957, Jdnes, Metropolitanos; Joaquin Garcia de la Noceda, Teniente Ramirez 1165, Urb. San Agustin, and Severino Ramos, Afrodita 674, Venus Gardens, all of, Rio Piedras, P.R.

Filed June 27, 1975, Ser. No. 591,107
Int. Cl.² G09B *3/00*
U.S. Cl. 35—48 A **11 Claims**



1. A multiple choice low visibility answer sheet on which a plurality of multiple choice answers are to be placed, comprising a plurality of uniquely identified groups of answer areas having regions defined on said answer sheet, a plurality of discrete answer areas located within each of said groups at which an answer may be indicated by marking over a desired discrete answer area in a group with a marking instrument, said discrete answer areas being substantially uniformly predarkened in relation to the regions of the groups surrounding said discrete answer areas and the contrast between marked and unmarked discrete answer areas being decreased, thereby decreasing the possibility of cheating.

3,995,382

INSTEP GUARD FOR SAFETY SHOES

Roy A. Smith, Red Wing, Minn., assignor to Red Wing Shoe Compnay, Inc., Red Wing, Minn.

Filed Oct. 22, 1975, Ser. No. 624,659
Int. Cl.² A43B *13/22*
U.S. Cl. 36—72 R **5 Claims**

1. A protective accessory for a boot comprising, in combination:

a padded, rigid metatarsal cap having a general configuration of a saddle and extending from a lower front edge to an upper rear edge;

a rigid scuff top, configured for application to the outside of the toe of a boot, and having a rear edge to arch over said toe and a front edge curved to engage said toe;

a hinge of pliable material having a central hinging portion and first and second edges spaced from said central portion;

first fastening means securing one edge of said hinge upon the outer surface of said scuff top along said rear edge thereof;

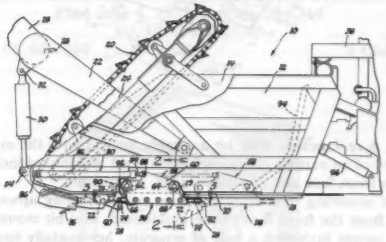
and second fastening means securing the other edge of said hinge along said lower front edge of said metatarsal cap to form a complete protective assembly adapted to be fastened to a boot by fasteners passing through said front edge of said scuff top into the toe of the boot.

3,995,383

SCRAPER BOWL WITH MOVABLE FLOOR SECTION

Richard C. Breitenstein, Solon, and Bernard A. Kuhl, Hudson, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1976, Ser. No. 650,451
Int. Cl.² E02F *9/28*
U.S. Cl. 37—126 AE **3 Claims**



1. In a scraper bowl having a pair of parallel spaced side walls the forward portions of which are interconnected by a fixed transversely extending cutting blade and the rearward portions of which are interconnected by a bottom wall in a manner whereby an opening through which earth material can be dumped is provided between the rear of the cutting blade and the front of the bottom wall, a movable floor section for normally closing said opening, said floor section being rectangular in configuration and including a front edge, a rear edge and a pair of side edges, each of said side walls rigidly supporting an elongated track, each side edge having a carriage assembly attached thereto for supporting the floor section for movement relative to the side walls along one of the tracks, each carriage assembly comprising a support plate fixedly connected to the associated side edge, a first roller and a second roller rotatably mounted on the support plate, a double-acting hydraulic cylinder on each side wall for moving the floor section between a first position wherein said floor sec-

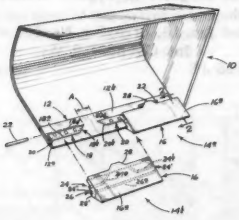
tion closes said opening and a second position wherein said floor section exposes said opening, a first pivot connection for connecting one end of said hydraulic cylinder to the associated side wall at a point located adjacent to the cutting blade, a second pivot connection for connecting the other end of the hydraulic cylinder to the support plate at a point located between said first and second rollers, a strike-off blade having a projection extending upwardly therefrom, means pivotally connecting said strike-off blade at the front edge of the floor section, and a block member secured to each side wall and having a flat surface horizontally aligned with the projection on said strike-off blade whereby movement of the floor section from the second position to the first position causes said projection to contact said flat surface and cam the strike-off blade upwardly into a position adjacent to the cutting blade so as to completely close said opening.

3,995,384

EDGE BIT STRUCTURE FOR IMPLEMENT BLADE

Jay J. Wood, Watsonville, Calif., assignor to John F. Duncan, Castroville, Calif.

Filed Nov. 25, 1974, Ser. No. 526,743
Int. Cl.[2] E02F 9/28; A01B 35/26
U.S. Cl. 37—141 R 7 Claims



1. A replaceable edge bit assembly for use with the moldboard of an earthworking implement, said moldboard including a front face and a working edge, comprising:

bit mounting means securable to and projecting upwardly from the front face of the moldboard, said bit mounting means including a pair of separate, horizontally spaced mounting parts spaced from and in parallel relation with the working edge, each said mounting part having an underbeveled lower edge which, when said mounting parts are secured to the front face of the moldboard, cooperates with the front face of the moldboard to define a groove opening in the direction of the working edge;

a replaceable edge bit including a first pair of receptor regions having a first pair of angular grooves complementary in configuration to the underbeveled lower edges of said mounting parts, and including a second receptor region spaced from said first pair of receptor regions and having a second groove complementary in configuration to the working edge of said moldboard, said receptor regions releasably engaging said mounting parts and releasably engaging and covering the working edge of the moldboard;

a retaining pin; and

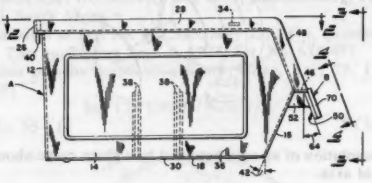
securing means on said edge bit adapted to cooperate with said mounting parts to receive said retaining pin and thereby releasably lock said edge bit to said moldboard.

3,995,385

STORAGE BIN WITH CARD HOLDER

Stuart A. Clipson, Glendale, and Theodore J. Day, Cincinnati, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 23, 1975, Ser. No. 580,131
Int. Cl.[2] G09F 3/18
U.S. Cl. 40—10 R 2 Claims



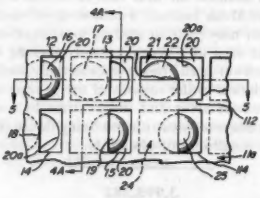
1. A storage bin including a downwardly inclined substantially flat front handle intersecting a vertical plane at its top edge at an included acute angle substantially less than ninety degrees, said handle having an outer surface including a generally rectangular area raised outwardly therefrom, said rectangular area including a bottom alignment edge and opposite side alignment edges respectively spaced inwardly from the bottom and opposite side edges of said handle, a card retaining pocket on said outer surface for retaining the side and bottom edges of a flat card which is positionable against said outer surface, said pocket being defined by a generally U-shaped member including a wall having an inner surface abutting said alignment edges and being bonded to said outer surface, said wall having a height greater than the distance said rectangular area is raised outwardly from said outer surface, an integral flange on said generally U-shaped member extending inwardly from the outer edge of said wall in outwardly spaced relationship to said generally rectangular area to define a peripheral groove which is upwardly open adjacent the top edge of said handle.

3,995,386

INFORMATION DISPLAY DEVICE

Hassan Paddy Abdel Salam, 80 Vicarage Court, London, W8 4HG, England

Continuation-in-part of Ser. No. 406,666, Oct. 15, 1973. This application July 3, 1975, Ser. No. 593,179
Claims priority, application United Kingdom, Oct. 18, 1972, 48029/72; Oct. 30, 1972, 49877/72
Int. Cl.[2] G09T 11/00
U.S. Cl. 40—28 C 2 Claims



1. In a rear-illuminated display apparatus including means defining a two-dimensional planar array of cells, each of said cells including parallel spaced first (1) and second (5) generally vertical wall means, and bottom (2), top, and end (5a) wall means, respectively, said first vertical wall means being opaque and containing for each cell a circular aperture (1a) adjacent one end of said cell, said second vertical wall means being light-transmissive, a plurality of opaque ferromagnetic shutters (3), each of said cells containing one of said shutters,

respectively, means (2, 1c) defining for each cell bistable first and second limiting positions at opposite ends of said cell between which said shutter is horizontally displaceable relative to said aperture in a direction parallel to the plane of the array, the aperture of each of said cells being so arranged that the passage of light through said aperture is prevented and permitted when said shutter is in said first and second limiting positions, respectively, and electromagnetic means (4, 4*a*) arranged for movement relative to said array of cells in a horizontal direction parallel to the plane of the array for displacing each of said shutters selectively between said first and second limiting positions, the improvement wherein

a. each of said shutters is spherical and free to rotate about a vertical axis; and

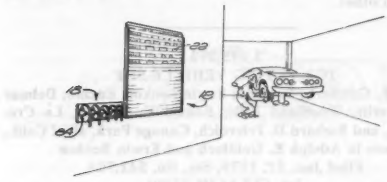
b. biasing means (2, 1*b*) associated with each of said cells, respectively, for biasing each of said shutters when in its first limiting position toward said first vertical wall to cause a portion of said shutter to extend into engagement with the margin of said aperture and thereby preclude the passage of the rear illumination through the apertures of those cells having shutters in said first limiting position, whereby each of said spherical shutters is adapted to be magnetically attracted against one of said vertical walls for rolling transport thereacross during displacement of said shutters between said first and second limiting positions.

3,995,387

SHOP LOAD DISPLAY SYSTEM

Joseph E. Lotts, Los Alamitos, Calif., assignor to Toyota Motor Sales U.S.A. Inc., Torrance, Calif.

Filed Aug. 25, 1975, Ser. No. 607,185
Int. Cl.² G09F *11/30*
U.S. Cl. 40—64 R **3 Claims**



1. A shop load display system for indicating the distribution of a plurality of variable time work loads among a plurality of employees comprising:

a display board having a time-increment lines superimposed thereon;

a plurality of reels containing job tabs formed of continuous strips positioned adjacent said display board for use with said board, said job tabs having means for indicating work assignments and time-increment lines thereon whose intervals correspond to the intervals of said time-increment lines superimposed on said display board and for cooperation therewith;

a top channel support superimposed over said display board time-increment lines for indicating the work period of the employees in hours and corresponding to the display board and tab strip time-increment lines;

channel supports superimposed over said display board beneath said top channel support, each of said channel supports having a sleeve for inserting job tab strips therein for indicating the various work assignments of the employees, and means inserted in each said sleeve for indicating the name of each of the employees, each channel support being assigned to one of the employees, and

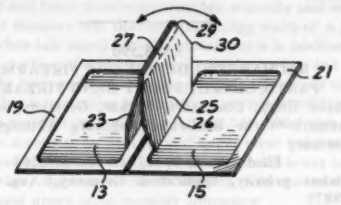
each said tab strip contains means for separating the continuous tab strips into single tabs, said single tab length time-increment being equivalent to an hour time-increment line superimposed on said board.

3,995,388

POP-UP PRODUCTS AND METHOD OF MAKING

Ib Penick, Prospect Heights, and John K. Volkert, Northfield, both of Ill., assignors to Compak Systems, Inc., Northfield, Ill.

Filed Dec. 8, 1975, Ser. No. 638,558
Int. Cl.² G09F *19/00*
U.S. Cl. 40—126 A **17 Claims**



1. An item of the character described which comprises

a basepiece which includes at least two base panels each having a lateral edge which lies generally along a common line along which said panels can be folded into superposed condition,

a first pop-up element attached to one base panel,

a second pop-up element attached to the other base panel,

said pop-up elements having lines of weakness formed therein dividing said elements into subelements, and

at least one of said subelements having adhesive disposed thereon for joining said subelement in surface-to-surface contact with a subelement of said other pop-up element,

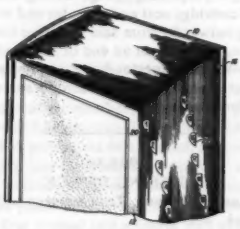
whereby joinder of said last-mentioned two subelements is effected upon folding said basepiece along said common line to bring said base panels into superposed condition.

3,995,389

REFERENCE INDEX SYSTEM

Tracy L. Mathis, P.O. Box 1425, Wickenburg, Ariz. 85358

Filed June 6, 1975, Ser. No. 584,364
Int. Cl.² B42F *21/00*
U.S. Cl. 40—360 **3 Claims**



1. A reference index and teaching tool enabling the beginning user to efficiently locate information compiled and arranged in sections in a book such as a dictionary, each separate section of the book containing information grouped according to separate letters within the alphabet, said system comprising:

a. guide means located on an exposed portion of said book for convenient reference, said guide means consisting of a list of the alphabetical sections contained within the book and a key numeral counterpart for each of the alphabetical sections, said key numerals being in seriatim arrangement and a distinct key numeral serving as a common identifier for each entire alphabetical section; and

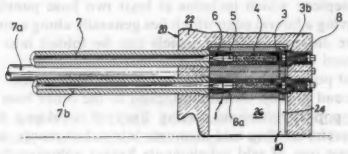
b. indicia means associated with each alphabetical section

in the book, said indicia means identifying the key numeral counterpart of the alphabetical sections, each page within a section carrying the key numeral common identifier for that section, whereby a particular alphabetical section can be located by the beginning user first locating the appropriate key numeral for an alphabetical section on the guide means and then finding that key numeral on the indicia means to locate the desired alphabetical section.

3,995,390
RECHARGING DEVICE FOR FIREARMS, PARTICULARLY SHORT HAND FIREARMS

Gerhard Hupp, Oberndorf, Neckar, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Aug. 6, 1974, Ser. No. 495,205
Claims priority, application Germany, Aug. 7, 1973, 2339875
Int. Cl.² F41C *1/00*, *25/00*; F42B *39/04*
U.S. Cl. 42—59 **5 Claims**



1. A firearm construction comprising a housing, at least one barrel on said housing having a firing bore terminating in an inner projectile charging end, said housing having a magazine compartment surrounding the projectile charging end of said barrel and having a cartridge sealing sleeve centered in respect to the bore of each of said at least one barrel and projecting rearwardly from said barrel into said magazine compartment, and a cartridge holder in said magazine compartment having a base plate with a plurality of circumferentially spaced cartridge holder bores therein, a cartridge bottom in each of said cartridge holder bores having a rear face with a priming cap chamber and a front face with a recess defining a cartridge seat, a propellant charge having an inner end engaged on said cartridge seat and an outer end with a blind bore and extending outwardly from said cartridge bottom so that its outer end is engaged against an end of said sealing sleeve, and a projectile having an inner end engaged in the blind bore of said propellant charge and an outer end extending into said cartridge sealing sleeve.

3,995,391
FISHING DEVICE

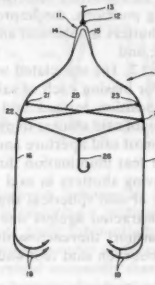
Jesse E. Bohannon, Mabank, Tex., assignor to Jesse E. Bohannon, Mabank, Tex.

Filed Sept. 18, 1975, Ser. No. 614,544
Int. Cl.² A01K *83/04*
U.S. Cl. 43—37 **1 Claim**

1. A fish device intended to be suspended from the end of a fishing line for retaining a fish on the fishing line once the fish nibbles at a baited hook, the device comprising, in combination:

an inverted U-shaped spring member having legs thereof extending downwardly from an apex portion suspended from the fishing line, a pair of arm members, each affixed at its top end to one of the leg members and extending downwardly and outwardly therefrom, a pair of double barbed hook members each affixed to the terminal free end of each arm member projecting inwardly toward each other in a confronting manner, means suspending the arm members, and means for triggering the arm members to effect the spring member to drive the arm members in a direction inwardly of each other; and

a hook suspended from said arm members by means of a pair of vertically spaced apart eyes affixed to one arm member, a second pair of vertically spaced apart eyes affixed to the other arm member, a flexible cord having one end tied to one eye of one arm from whence it is trained through an eye of the other arm from whence it is trained back to the remaining eye of the first arm from

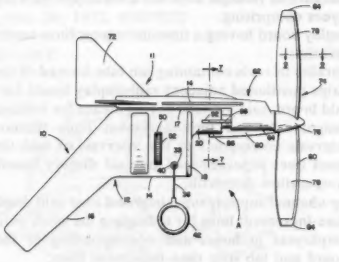


whence it is trained back to the remaining eye of the second arm to which it is permanently tied thereto, the fishing hook being suspended intermediate the arm members on the run of the cord which is nearest the double barbed hook members, with the means for triggering the spring member comprising the cord which pulls the arms slightly together upon a fish nibbling on the hook, this effecting closing of the legs of the spring member to drive the double barbed hooks in a direction inwardly toward each other.

3,995,392
TOY FLYING VEHICLE SET

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe

Filed Jan. 21, 1975, Ser. No. 542,726
Int. Cl.² A63H *27/00*
U.S. Cl. 46—78 **28 Claims**



1. A toy set comprised of:

a. a launcher comprising:

1. a housing,
2. a gear containing drive mechanism retained by said housing,
3. drive shaft means operatively connected to said gear containing drive mechanism,
4. actuating means for actuating said drive mechanism and thereby imparting rotation to said drive shaft means upon manual actuation of said actuating means,

5. interlock means including a coupling mechanism operatively associated with one end of said drive shaft means, a collar forming part of said coupling member and having an arcuately shaped flange receiving slot,

b. a flying vehicle comprising:

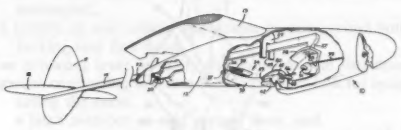
1. a vehicle body,
2. a pair of wings extending from said vehicle body,
3. a rotary member including rotary shaft means associated with said body for driving said body when rotation is imparted to said rotary shaft means,
4. a propeller driven by said rotary shaft means in a plane substantially perpendicular to the plane of extension of said wings,
5. and cooperating means including a flange extending radially outwardly with respect to said rotary shaft means on one end of said rotary shaft means engageable in detachably interlocking relationship with said flange receiving slot in said interlock means by extending into said slot and being locked therein when said rotary shaft means is not rotating, said flange being detachable from said slot upon rotation of said rotary shaft means when the speed of rotation of said drive shaft means decreases relative to the speed of rotation of said rotary shaft means so that said flying vehicle is capable of being propelled into flight with an initial horizontal trajectory.

3,995,393

MODEL GLIDER AND METHOD OF FLYING

Douglas Edward Patterson, 5125 Williams Fork Trail No. 205, Boulder, Colo. 80301

Filed Nov. 10, 1975, Ser. No. 630,559
Int. Cl.² A63H *27/00*
U.S. Cl. 46—79 **11 Claims**



9. A model glider comprising:

a fuselage having attached thereto wings and movable pitch attitude control means;

biasing means urging the pitch attitude control means into an upward configuration;

releasable latch means operably connected to the pitch attitude control means to releasably latch the movable pitch attitude control means in a neutral configuration; and

timing means positioned adjacent the latch means to contact and release the latch means a predetermined length of time after activation of the timing means,

whereby the glider may be launched with the pitch attitude control means latched in the neutral position and reconfigured to an upward position in flight when the timing means releases the latch means.

3,995,394

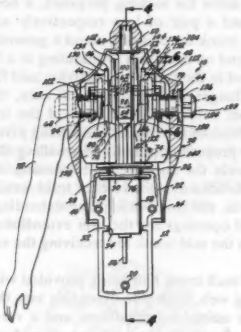
GROWTH-SIMULATING FIGURE TOY

Ian Frederick Ayton, Palos Verdes Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 24, 1975, Ser. No. 571,330
Int. Cl.² A63H *33/00*
U.S. Cl. 46—119 **3 Claims**

1. In combination with a growth-simulating figure toy comprising a lower torso member including a waist member having a lower portion of a first predetermined girth and an upper portion of a second predetermined girth less than said first predetermined girth; a pliable rubber-like upper torso member having a neck portion, and a pair of shoulder openings and a waist member, said upper torso waist member being slidably mounted on said lower torso waist member, said upper torso waist member conforming to the shape and girth of said lower torso waist member regardless of the location of said upper torso waist member with respect to said upper and lower portions of said lower torso waist member, whereby said upper torso waist member will simulate the pudgy waist of a preteenager when said upper torso waist member is in position on said lower portion of said lower torso waist member and will simulate the trim waist of a teenager when said upper torso waist member is in position on said upper portion of said lower torso waist member; and means connected to said upper and lower torso members for moving said upper torso waist member from one position to another position on said lower torso waist member, the improvement wherein said means connected to said upper torso member comprises:

a support bracket mounted in said lower torso member, said support bracket including a first bearing member positioned adjacent one of said shoulder openings and a second bearing member positioned adjacent the other of said shoulder openings;



a crank having a first journal rotatably mounted in said first bearing member, a second journal rotatably mounted in said second bearing member, a first crank pin extending into said one shoulder opening, a first web connecting said first crank pin to said first journal, a second crank pin extending into said other shoulder opening, a second web connecting said second crank pin to said second journal, a third crank pin, a third web connecting said third crank pin to said first journal and a fourth web connecting said third crank pin to said second journal;

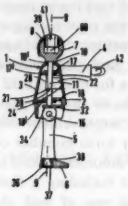
an actuator bar having a lower end reciprocably mounted in said support bracket in said lower torso member, an upper end connected to said upper torso neck portion and an intermediate portion lying adjacent a plane passing transversely of the figure-toy long axis and containing the axis through said shoulder openings, said intermediate portion being provided with a transverse slot, said third crank pin being mounted in said transverse slot, whereby said third crank pin will raise and lower said actuator bar and said first and second crank pins will raise and lower said shoulder openings of said upper torso member relative to said support bracket when said crank is rotated; and

means connected to said crank for imparting rotation thereto.

3,995,395
EASILY ASSEMBLABLE TOY FIGURE

Dietmar Rahmstorf, Nurnberg, Germany, assignor to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag, Furth, Bavaria, Germany

Filed Feb. 3, 1976, Ser. No. 654,903
Claims priority, application Germany, Feb. 18, 1975, 2506786
Int. Cl.² A63H 3/00
U.S. Cl. 46—161 12 Claims



1. An assemblable toy figure, comprising a head, a generally downwardly projecting vertical locking bar secured to said head and rotatable therewith, an upwardly flattened shoulder on said bar to serve for locking purposes, a hollow trunk, a pair of arms and a pair of legs respectively adapted to be mounted in the trunk for pivoting about a generally horizontal axis, an upper end on each arm terminating in a flange, lateral openings defined in the trunk for receiving said flanges, extensions on said flanges serving as pivotal axes, the legs being engageable from below into the front of the trunk, a notch defined in the front of the trunk for enabling pivotal leg movement, laterally projecting pins for journalling the legs within the trunk, wherein the improvements consists in that

the trunk is divided along a vertical transverse axis into two trunk halves, the transverse plane extending through the said lateral openings for the arm extensions and through recesses in the said trunk for receiving the said pins of the legs,

the inside of each trunk half being provided with at least one connecting web, each web extending into the other trunk half in the assembled condition, and a vertical bore defined in each web, the bores being aligned when the trunk halves are assembled together for permitting the locking bar to project through all the bores, and

wherein two oblique resilient webs are formed at one of the trunk halves and extend downwardly as well as towards each other, terminating in generally horizontal lower edges that have limited freedom to move apart in parallel, the edges overlapping the transverse plane perpendicularly to the latter and serving to cooperate and engage with the shoulder of the locking bar for locking.

3,995,396
INFLATABLE TERRARIUM ASSEMBLY WITH REPLACEABLE DOMES

Donald Spector, Union City, N.J., assignor to Applied Research Commodities Industries, Inc., Hyattsville, Md.

Continuation-in-part of Ser. No. 533,518, Dec. 17, 1974, Pat. No. 3,939,607. This application Nov. 17, 1975, Ser. No. 632,708
Int. Cl.² A01G 9/02
U.S. Cl. 47—69 11 Claims

1. A collapsible terrarium assembly comprising:

A. a base having a circular ridge formed on the upper face thereof adjacent to and concentric with the periphery of the base;

B. a replaceable dome mountable on the base and constituted by a flexible, non self-supporting bag fabricated of clear plastic film material having a circular open mouth from which an annular skirt extends outwardly, the diameter of the mouth being somewhat smaller than the diameter of the ridge, whereby the dome is seated within the ridge;

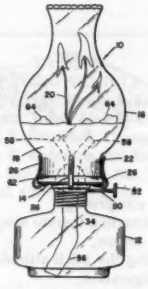
C. a removable coupling ring attachable to the ridge to clamp the skirt of the dome therebetween to hermetically seal the dome; and

D. means secured to the dome to effect inflation and erection thereof.

3,995,397
PLANTER FOR PLANTS

Victor R. Despard, III, Lancaster, Pa., assignor to Kaadan, Ltd., Lancaster, Pa.

Filed Jan. 14, 1976, Ser. No. 648,902
Int. Cl.² A01G 27/00; F21L 19/00
U.S. Cl. 47—81 6 Claims



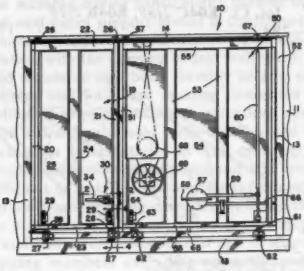
1. A self-watering planter for plants comprising an oil-burning type lamp including a hollow base, a burner having means to support a wick and a laterally extending gallery supporting a plurality of prongs extending upwardly away from said base, hollow circular connecting means on said base and burner detachably securing the same together and provide a passage therethrough, a flat-type wick formed from textile material and capable of absorbing water and transmitting it along the wick by capillary action, and a transparent lamp chimney having a base portion fitting the rim of said gallery of said burner and engaged by said fingers thereon to support said chimney in upright position upon said burner, in combination with sealing material between the perimeter of said gallery of said burner and the rim of the base of said chimney to secure said chimney to said burner, and agricultural soil in the lower part of said chimney and supported by said gallery of said burner, said soil being adapted to have plants planted therein and said wick being arranged to have a portion extended upwardly into said soil and also extend through said burner into said base and adapted by capillary action to convey water from said base through said hollow connecting means for said burner and base into said soil to maintain said soil moist.

3,995,398

OPERATING MECHANISM FOR DOUBLE SLIDING DOORS

Walter J. Marulic, Gary, and Ronald W. Marsh, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,302
Int. Cl.[2] E05D *15/48, 15/10*
U.S. Cl. 49—168 10 Claims



1. A vehicle having a door opening, first and second doors positioned side by side in said opening, said doors being slideably supported on said vehicle for movement from a position closing said opening to an open position to one side of said opening, said second door having a bolt locking member engageable with a portion of said vehicle to lock said second door in said opening, and an operating member on said second door connected to said locking member for moving the same between locking and unlocking positions, the improvement of;

a door locking mechanism for said first door comprising;

a second bolt connected to said first door for relative sliding movement,

a keeper on said vehicle engageable by said second bolt for locking said first door,

an actuating lever pivotally connected to said first door,

means connecting said lever to said second bolt for reciprocating the same,

a latch member on said second door, and

a latch element on said second bolt engageable with said latch member to interconnect said doors in the unlocked position of said bolt.

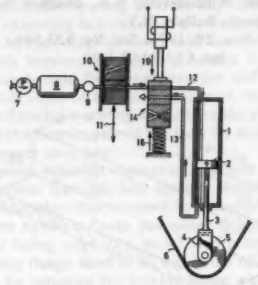
3,995,399

WIDE BELT GRINDING MACHINE INCLUDNG MEANS TO RELIEVE TENSION ON THE BELT IN CASE OF POWER FAILURE

Helmut Weiner, Springe, and Kurt Fischer, Munder, both of Germany, assignors to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

Filed July 14, 1975, Ser. No. 595,499
Claims priority, application Germany, July 16, 1974, 2434210
Int. Cl.[2] B24B *21/00*
U.S. Cl. 51—148 9 Claims

1. A wide belt grinding machine having at least one motor driven, endless abrasive belt; a cylinder; a dual controlled piston guidably arranged in the cylinder; a tensioning roll operatively connected with the piston for tensioning the abrasive belt; feed lines connecting the cylinder with a pressure source to effect the dual control of the piston; and control means associated with the feed lines for reversing the pressure



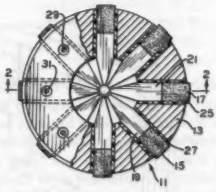
force effective on the piston to relieve tension on the abrasive belt in the event of power failure.

3,995,400

HONING TOOL SLOT LINER AND ABRASIVE RETAINER

Robert H. Gillette, Angola, Ind., assignor to Results Engineering, Inc., Angola, Ind.

Filed May 7, 1975, Ser. No. 575,149
Int. Cl.[2] B24B *33/08*
U.S. Cl. 51—338 13 Claims

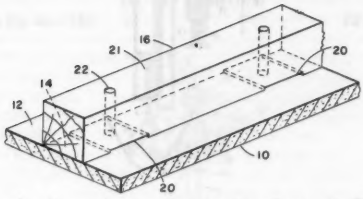


1. In a honing tool having a generally cylindrical body portion provided with a plurality of longitudinally extending outwardly opening radial slots, an abrasive element formed entirely of abrasive material disposed in each of said slots, a like plurality of expander plates adjacent to but unconnected with the corresponding abrasive elements, carried by the body and projecting radially outwardly with the outer end portions thereof being disposed in the slots and engaging respective abrasive elements, and means for selectively urging all the expander plates and therefor also the abrasive elements simultaneously radially outwardly and into engagement with a workpiece, an improved means for mounting and retaining individual abrasive elements in their respective slots comprising a bushing supported against radial movement in the body portion within the slot and extending radially to simultaneously girdle at least a portion of the abrasive element and at least a portion of the pertaining expander plate with the abrasive element being supported for radial movement relative to the bushing and being retained therein by frictional engagement between the abrasive element and the bushing.

3,995,401
METHOD OF ATTACHING WALLBOARD AND STUD THEREFOR

Richard E. Smith, Williamsville, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,666
Int. Cl.² E04B 1/00
U.S. Cl. 52—127 8 Claims

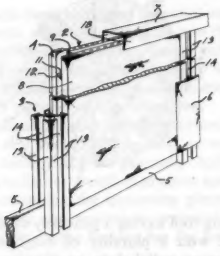


1. An elongate framing member for instantaneous reception of molten hot melt adhesive at a face thereof, said framing member comprising a body with one elongate narrow face thereon for affixation to wallboard, a shallow depression in said face of said framing member, said depression having a size adapted for filling rapidly with a relatively minimum thickness of a molten hot melt adhesive, and an exposed inlet for injecting molten hot melt adhesive therethrough into said depression when said face is covered with a flat surface of a wallboard.

3,995,402
PANELLING ASSEMBLY FOR PARTITIONS, WALLS OR THE LIKE

Gerard Parenteau, Rang Bord de l'eau, St. Bernard de Dorchester, Quebec, Canada

Filed June 4, 1975, Ser. No. 583,626
Int. Cl.² E04H 1/00
U.S. Cl. 52—241 5 Claims

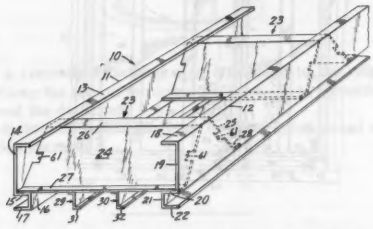


1. A panelling assembly comprising an operatively upright panel having a pair of opposite upright edges, each having one groove extending into said edge longitudinally thereof, a pair of slats each retractably engaging edgewise into one of said grooves, each of said slats having slots downwardly inwardly extending therethrough in parallel inclined relationship relative to the length thereof, pins projecting transversely of said panel through said grooves in engagement in said slots respectively, a baseboard, said panel includes a bottom groove extending inwardly from the bottom edge thereof and each of the lower ends of the slats protract operatively downwardly into said bottom groove, and said baseboard has an edge operatively engaging into said bottom groove and with said lower ends and restraining said slats against downward movement upon downwardly resting said panel on said baseboard edge, whereby to upwardly and outwardly displace said slats relative to said panel by action of said pins in said inclined slots.

3,995,403
CONSTRUCTION MODULE AND STRUCTURES ASSEMBLED THEREFROM

Marvin E. Nickell, 12504 Chippewa Lane, Burnsville, Minn. 55337

Filed June 26, 1975, Ser. No. 590,408
Int. Cl.² E04C 2/38; E04B 2/28
U.S. Cl. 52—284 17 Claims

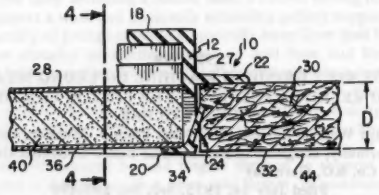


1. A structure comprising a structural module having a framework including a first longitudinal edge beam having an angular generally S shaped cross-section and a parallel second longitudinal edge beam having an angular generally reverse S shaped cross-section, each of said beams having a deep upper portion and a shallow lower portion, said beams each consisting essentially of narrow top, intermediate and bottom bands parallel to each other and to the plane of the module, and a deep and a shallow side panel perpendicular to said bands, said deep panel joining said top and intermediate bands along their outer edges and said shallow panel joining said intermediate and bottom bands along their inner edges, said beams being interconnected by spaced cross-members perpendicular thereto terminating within said deep portions and having a V shaped cross-section with the open side of the V facing said lower portion.

3,995,404
ATTACHMENT FOR HOLLOW WALLS AND METHOD OF REPAIRING SAME

Allan Thaw, Massapequa Park, and John Milcetich, Huntington Station, both of N.Y., assignors to Mechanical Plastics Corporation, Farmingdale, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,443
Int. Cl.² E04D 1/00
U.S. Cl. 52—514 22 Claims



1. An attachment for retaining a section of wallboard panel configured and dimensioned to substantially conform to an opening defined by a portion of wallboard which comprises:

a. a body member;

b. means on one side of said body member to grip a marginal portion of said wallboard adjacent an opening configured to receive a panel correspondingly configured and dimensioned to the opening;

c. panel support means on the opposite side of said body member configured and dimensioned such that when at least one attachment is positioned along at least two opposed marginal portions of said opening of said wallboard said panel support means extends inwardly of said opening in a manner to support said panel in nestled relation therewithin;

d. said body member is comprised of a substantially plate-like member having substantially parallel opposed faces and said panel support means is configured and dimensioned to support a replacement repair panel in nestled relation with the opening of said wallboard;

e. said means on said body member to grip marginal portions of said wallboard opening comprises at least two wallboard gripping members extending upwardly away from a first face of said body member and spaced from each other sufficiently to at least grippingly secure the attachment to a marginal portion of said opening at least sufficient to maintain the attachment in said position;

f. said wallboard gripping members are comprised of at least one plate-like member extending away from said first face of said body member and a first pair of spaced elongated gripping members extending upwardly away from said body member and spaced from said plate-like gripping member by a distance sufficiently less than a first thickness of a standard wallboard panel sufficient to provide gripping engagement of said attachment to said wallboard panel between said first gripping member and said first pair of gripping members, at least at three positions of contact between the first gripping member and the first pair of spaced gripping members; and

g. said first pair of elongated gripping members are frangibly secured to said plate-like body member and said means on said body member to grip marginal portions of said wallboard opening further comprises a second pair of elongated gripping members extending upwardly away from said first face of said body member and spaced from said plate-like gripping member a distance greater than said first pair of elongated gripping members, but sufficiently less than a second standard wallboard thickness such that the attachment is securable to a marginal portion of said wallboard opening by removing said first pair of gripping members along said frangible portions and securely gripping said wallboard portion between said plate-like gripping member and said second pair of elongated gripping members.

3,995,405

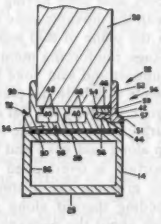
PANEL MOLDING

Thomas R. Peterson, Spring Lake, Mich., assignor to Structural Concepts Corporation, Spring Lake, Mich.

Filed June 25, 1975, Ser. No. 590,390

Int. Cl.² E04C *2/00*

U.S. Cl. 52—627 **11 Claims**



1. Panel molding for wall panels and the like comprising:

a base member of indeterminate length formed of an extruded plastic material and having a cross-sectional configuration characterized by a top, bottom and opposite sides, an upright retaining flange extending from one side of said base generally at right angles to the top side of the base and adapted to abut a first marginal edge of a panel, a lateral slot opening from an opposite side of the base and extending in a direction generally parallel to the top and bottom sides thereof, said slot being spaced sufficiently between the top and bottom sides to provide a relatively rigid flange between the slot and the top and bottom sides of the base, means on the top side of the base forming a seating surface for the panel;

means at a bottom side of the base for securing the base to a support structure;

a one-piece extruded retainer of indefinite length formed of a flexible material, said retainer having a crosssection configuration characterized by an upright panelretaining means having a flange positioned to abut a second marginal facing edge of a panel, and a laterally extending locking flange sized to fit within the base lateral slot;

means for retaining the locking flange within the slot; and

a plurality of hollow channels opening at the top side of the base.

3,995,406

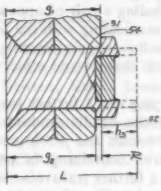
RIVET FASTENER SYSTEM

Irwin E. Rosman, 23710 Clarendon St., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. Nos. 360,533, May 15, 1973, abandoned, and Ser. No. 480,760, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 321,457, Jan. 5, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,330

Int. Cl.² F16B *5/04, 19/04*

U.S. Cl. 52—758 D **33 Claims**



1. In combination: a workpiece comprising a plurality of objects having a continuous hole therethrough having a first end and a second end and possessing an axis, and a grip length equal to the combined thicknesses of the objects between the two ends of the hole; and a two-piece rivet assembly in said hole, said two-piece rivet assembly comprising: a rivet having an enlarged head at a first end abutting a surface of said workpiece at said first end of the hole, a shank contiguous to and integral with said enlarged head within said hole, said shank being solid from said enlarged head substantially to the second end of the hole but not beyond it, an initially tubular upsettable portion contiguous to and integral with the said shank at the other end of the rivet, an end surface on said initially tubular upsettable portion, the solid shank and the initially tubular upsettable portion being externally circular, the initially tubular upsettable portion having an inside wall which bounds an internal recess opening onto said other end of the rivet, and a termination surface on the end of the solid shank inside the recess and bounded by said inside wall, and a substantially shape-retaining core pin in the recess, said core pin having a core pin surface adjacent to the terminating surface, the initially tubular upsettable portion being upset and forming an upset head which surrounds at least a portion of said core pin, said upset head bearing against a surface of said workpiece at said second end of the hole, the said rivet having been set at least in part by applying a compressive axial end force to the end surface of said initially tubular upsettable portion, said initially tubular upsettable portion and said core pin having cooperating overlapping portions preventing axial

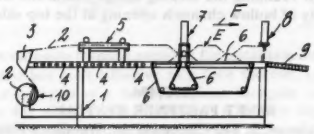
separation from one another after rivet upset, the said inside wall extending inwardly toward the axis to form its said overlapping portion, the maximum diameter of the upset head being larger than the maximum diameter of the core pin, the core pin having substantially retained its shape during upset.

3,995,407

MACHINE FOR PACKAGING PRODUCTS TO BE PRESERVED UNDER VACUUM OR ATMOSPHERE OF SUITABLE GASES

Luigi Segale, Via Nullo 5, Caravaggio (Bergamo), and Pier Enrico Passerini, Via Arco 13, Rho (Milan), both of Italy

Filed Nov. 3, 1975, Ser. No. 628,380
Claims priority, application Italy, Nov. 12, 1974, 29328/74
Int. Cl.[2] B65B *31/08*
U.S. Cl. 53—112 A **8 Claims**



1. A machine for packaging a product in a controlled atmosphere comprising:

means for wrapping the product with a length of flexible sheet material;

means for sealing the longitudinal edges of said material to form a package for the product;

means for carrying out a first transverse seal to close the package, including a pair of opposed sealing electrodes;

means for communicating with the interior of the package including a hollow needle piercing the sheet material to produce a hole therein and effect said controlled atmosphere;

means for carrying out a further transverse seal at such a position that the needle-produced hole is isolated between the two seals and not in communication with the package interior containing the product, said means for carrying out a further transverse seal including a second pair of opposed sealing electrodes;

guide means supporting said first and second transverse sealing means and said communicating means for longitudinal rectilinear movement thereof; and

means for sequentially operating in order said first sealing means, then said communicating means, then said second sealing means while said first and second transverse sealing means and said communicating means move in a feed direction of said sheet material.

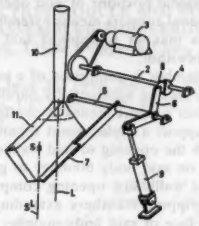
3,995,408

PROCESS AND APPARATUS FOR FILLING FOLDABLE OR RIGID PACKAGES

Wolfgang Guenther; Gunter Thielen, both of Ludwigshafen; Hans Hackner, Gernsheim, and Friedrich Ferdinand Hauptstein, Krefeld-Traar, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 30, 1975, Ser. No. 618,043
Int. Cl.[2] B65B *1/22, 7/06*
U.S. Cl. 53—126 **4 Claims**

1. Apparatus for filling a container supported under a spout with flowable solids supplied from the spout and comprising a shaft, piston-cylinder means connected to said shaft for turning said shaft, a container support member mounted on said shaft for pivotal movement when said shaft is rotated, said member being pivotable between a first, rest position without contacting the container and a second, container-supporting position wherein, in the latter position, the container under said spout has one side resting on said member and the container thereby is tilted from its normal filling position, vibration-inducing means adjacent said shaft, and contact means on said shaft movable into contact with said vibrating means



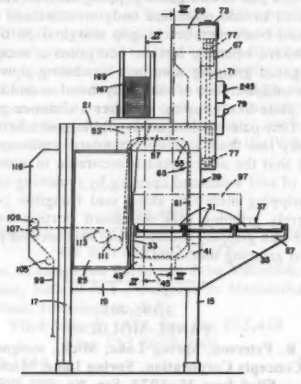
when said support member is in the container-supporting position whereby vibrations of said vibration-inducing means are transmitted via said shaft and said support member to said container and its content of said flowable solids.

3,995,409

STRAPPING APPARATUS

James L. Discavage, Prospect Park, Pa., and Carl R. Pepmeier, Fredericksburg, Va., assignors to FMC Corporation, Philadelphia, Pa.

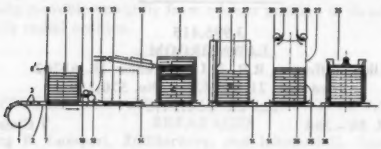
Filed May 2, 1975, Ser. No. 574,059
Int. Cl.[2] B65B *27/06, 61/20*
U.S. Cl. 53—137 **10 Claims**



1. A package strapping apparatus including a package support disposed in one plane, a package receiving yoke disposed in a plane extending at an angle to and intersecting with the plane of said support, said yoke having a fixed section and a movable section with the movable yoke section being adapted to extend through the plane of said support, means for positioning a flat package reinforcing member within said yoke, adjacent to said support and said yoke fixed section and in a plane which intersects with both the plane of said support and the plane of said yoke whereby the flat reinforcing member is in position to be strapped to a package on said support, means for feeding a strap along said yoke and into position in which its leading end portion is overlapped by a trailing portion thereof, means for gripping the leading end portion of the strap after the feeding thereof along said yoke, means for tensioning the strap about the package on said support after the leading end portion thereof is gripped, means for sealing said leading end portion of the strap to an overlapping trailing portion thereof, and means for reciprocating said movable yoke section in the plane of said yoke between a retracted position, in which such movable yoke section is spaced from

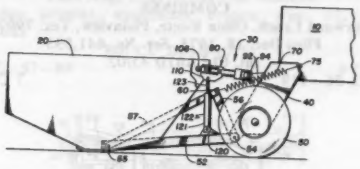
said support, and a projected position in which such movable yoke section extends through the plane of said support.

3,995,410
PACKAGE FORMING APPARATUS
Marius Leopold Hypolite Berghgracht, Place Joyale, Vineuil sur Firmin pres Chantilly (Oise), France
Continuation-in-part of Ser. No. 397,315, Sept. 14, 1973, abandoned, which is a division of Ser. No. 263,208, June 15, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,511
Claims priority, application Luxembourg, June 15, 1971, 63337
Int. Cl.² B65B *35/50*, *53/02*
U.S. Cl. 53—159 2 Claims



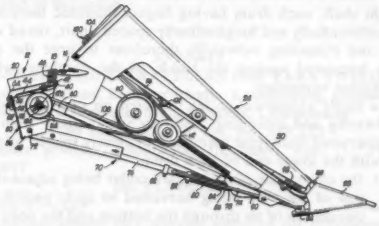
1. Apparatus for forming and covering a package of stacked articles comprising conveyor means having an intermittently driven belt, a multiplicity of laterally spaced generally parallel upstanding segmented units mounted on said belt, said segmented units being arranged in longitudinal end to end relationship and defining at least two parallel channels extending lengthwise of said belt, a plurality of spaced upstanding lugs mounted on said belt between said segmented units, a feeding station located above said belt, said feeding station including a plurality of guide means, at least two stacks of individual support members located above said channels and fed by gravity so that the lowermost support members engage said belt, said lugs engaging and removing the lowermost support means from each stack when said belt is driven, a gluing station located adjacent to said feeding station, means at said gluing station for applying adhesive to the upper surface of each of said support members, a base applying station spaced from said feeding station, a sheet of flexible thermoplastic material being placed on said support members at said base applying station so that said sheet is bonded to said support members, a loading station spaced from said base applying station, means for supplying a plurality of articles to said loading station so that said articles may be placed in stacked realtionship on said base sheet, a covering station spaced from said loading station, said covering station including a pair of generally vertically disposed rolls of heat retractable thermoplastic material located on opposite sides of said belt, means for sealing said plastic material together to form a screen extending across said belt in a position to be engaged by the leading face of said stacked articles, means for closing said screen about the trailing face of said articles, said covering material extending substantially above said articles, a top forming station spaced from said covering station along said belt, means at said top forming station for folding the upper portions of said covering material together and sealing the same, means for raising portions of said base sheet into engagement with the lower portions of said covering material, a sealing station spaced from said top forming station along said belt, and means at said sealing station for sealing said base sheet to said covering material and causing said covering material to shrink into intimate engagement with said articles, whereby a sealed watertight package is formed around a stack of articles mounted on spaced feet.

3,995,411
OSCILLATING MOUNTING SUPPORT FOR AGRICULTURAL INSTRUMENT
Rodney J. Johnson, Owatonna, Minn., assignor to Owatonna Manufacturing Company, Inc., Owatonna, Minn.
Filed May 16, 1975, Ser. No. 578,101
Int. Cl.² A01D *35/12*, *75/28*, *75/22*
U.S. Cl. 56—15.8 7 Claims



1. A mounting system adapted to mount an implement on one end of a tractor comprising, a pair of fixed lower arm members pivotally connecting the implement to the tractor at a lower portion of the implement and the tractor, a pair of upper arm members for pivotally connecting the tractor to the implement at an upper portion of the implement and the tractor, said pivotal connections between the upper and lower arms and the implement and the tractor being in a horizontal plane and generally parallel to one another, said upper arm members being telescopic and each include a second pivot whose axis is normal to the pivot axis of the arms in the horizontal plane, spring means connected between the implement at the lower portion thereof and the tractor at an upper portion thereof, and means connected between the upper and lower arm members to raise the implement relative to the tractor.

3,995,412
ROW UNIT ATTACHMENT FOR COMBINES
Melvin V. Gaeddert, Newton, Kans.; Leonard W. Hodson, Claremore, Okla., and David J. Jordan, Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed Aug. 14, 1974, Ser. No. 497,216
Int. Cl.² A01D *45/02*
U.S. Cl. 56—98 23 Claims



23. A row crop attachment for a harvesting machine having a header provided with a sickle and a pan for receiving severed crops from the sickle, said attachment comprising:
a frame;
means for releasably attaching said frame to the header;
a pair of elongated, laterally spaced-apart dividing members having rear ends mounted on said frame and free front ends spaced forwardly from the frame,
said members defining a longitudinally extending crop receiving passage therebetween from said front ends to said rear ends and each member being freely swingable on said frame in a normally vertical direction independently of the other member;
crop-gathering means including a pair of opposed, crop-engaging elements disposed on opposite sides of said

passage and extending between the opposite ends of said members for delivering crops through the passage and to the sickle when the attachment is on the header and the machine is advanced along a crop row; and

a drive coupled with said elements for operating the same.

3,995,413

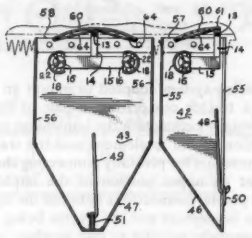
ATTACHMENTS FOR ROW TYPE BROADCAST COMBINES

Roy Durward Lynch, Olton Route, Plainview, Tex. 79072

Filed Dec. 18, 1975, Ser. No. 641,893

Int. Cl.² A01D *45/02*

U.S. Cl. 56—119 **7 Claims**



1. An attachment for a broadcast type combine having a sickle, which combine has a row harvester attachment thereon, which row harvester attachment includes an elongated transverse frame, braces forming support members extending downwardly from the elongated transverse frame at spaced intervals therealong so as to be between the rows of the crop being harvested, a further support member secured to the lower end of each downwardly depending brace support member and extending laterally therefrom, an apertured transverse member mounted near the outer end of each said further support member and extending therefrom, the transverse member being apertured near the outer ends thereof, spaced apart bearings mounted on the elongated row harvester frame and mounting the upper ends of the spaced apart upright shafts, bearings mounted on the apertured transverse member and mounting the lower ends of the upright, spaced apart shafts, a rotatable drum mounted on and secured to each upright shaft, each drum having fingers mounted thereon in circumferentially and longitudinally spaced apart, timed relation, and extending outwardly therefrom to urge the crop being harvested against the sickle of the combine, which attachment comprises;

a. a partly cylindrical collar mounted on each said lower bearing and extending upwardly substantially from the apertured transverse member into closely spaced relation with the lower end of each drum,

1. the closed side of each guard collar being adjacent the row of the crop being harvested so as to permit free circulation of air through the bottom and the open side portion of each partly cylindrical bearing guard collar.

3,995,414

REMOVABLE TRASH BAG ASSEMBLY FOR LAWN MOWERS

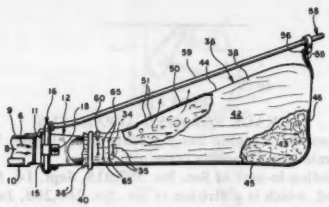
Frederic L. Kerr, 11613 Albany Drive, and Carol A. Carrigan, 11617 Albany Drive, both of Merrionette Park, Ill. 60655

Filed Apr. 14, 1975, Ser. No. 567,697

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **9 Claims**

1. For use in a mower structure of the type having a trash outlet portion; a foraminous bag adapted to be suspended from said mower structure comprising a body portion having primary vent means and having a neck portion adapted to be positioned in communication with the outlet portion, normally closed auxiliary vent means on said neck portion operable to open and vent said bag upon said primary vent means being obstructed by material in the bag, and said mower outlet



portion comprising baffle means disposed in shielding relation to said auxiliary vent means with respect to material entering said bag to prevent exit of material through said auxiliary vent means.

3,995,415

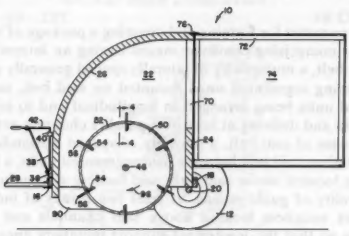
LAWN BROOM

John Allen Hoffmann, R.R. 1, Lynn Center, Ill. 61262

Filed Apr. 21, 1975, Ser. No. 570,229

Int. Cl.² E01H *1/04*

U.S. Cl. 56—364 **7 Claims**



4. Mobile apparatus for collecting lawn debris including a wheel supported housing adapted to be moved forwardly over the surface to be cleaned and having an open bottom, a rotary broom mounted in the housing for rotation about an axis transverse to the normal direction of movement of the housing and having at least a portion thereof projecting through the open bottom of the housing, and collector means connected to the housing for receiving debris from the rotary broom, characterized in that the rotary broom includes a drum, a plurality of sweep elements disposed about and in radially outwardly projecting relation to the drum and each having a sweep portion and a mounting portion, and lost motion mounting means connecting each of the sweep elements to the drum for rotation therewith and for free radially outwardly and inwardly movement through a predetermined range in response to centrifugal force as the drum rotates and variations in ground contour encountered by the elements, respectively.

3,995,416

HAY MAKING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 14, 1974, Ser. No. 469,764

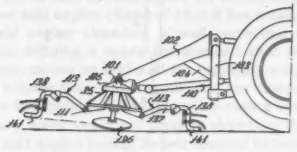
Claims priority, application Netherlands, May 15, 1973, 7306706

Int. Cl.² A01D *79/00*

U.S. Cl. 56—370 **37 Claims**

1. A hay making machine attachment comprising frame means and at least one rake member with a central portion

rotatably mounted on an upwardly extending shaft supported on said frame means, said rake member having arms pivotably associated with said central portion and said arms being pivotable about corresponding axes, tines being pivoted to said arms, said arms being freely movable by centrifugal force about said axes outwardly from said shaft and said tines being moved to substantially radial positions during the operative



rotation of said rake member, said tines being arranged in groups and each group being mounted on a tine support connected to a corresponding one of said arms, said support having the general shape of a U-shaped bracket with limbs being located one above the other and said bracket with tines being movable upwardly from a lower position to its substantially radial position.

3,995,417

PROCESS AND APPARATUS FOR COUNTING YARN BREAKAGES

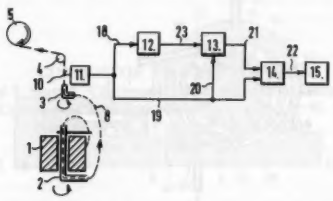
Jurg B. Lumpert, Zollikerberg, and Edouard G. Ammann, Baretswil, both of Switzerland, assignors to Palitex Project-Company G.m.b.H., Krefeld, Germany

Filed July 11, 1975, Ser. No. 595,006

Claims priority, application Switzerland, July 15, 1974, 9700/74

Int. Cl.² D01H *13/32*

U.S. Cl. 57—34 R **7 Claims**



5. In a textile machine of the type comprising supply bobbin mounting means and a processing station for receiving at least one yarn withdrawn from similar supply bobbins mounted in succession on said mounting means, the improvement comprising the combination of a yarn breakage surveying device for detecting interruptions, due to supply bobbin changing and to yarn breakages, of yarn passing from said supply bobbins to said processing station and generating a series of impulses determined respectively by said interruptions, a differentiating circuit, a timing circuit, a gate, connecting conductors for simultaneous transmission of said impulses to said differentiating circuit, said timing circuit and said gate, a connecting conductor for transmission of signals from said differentiating circuit to said timing circuit and a transmission conductor for transmission of timing signals from said timing circuit to said gate, said differentiating circuit being controlled by said impulses to transmit to said timing circuit signals synchronous with the initiation of each passage of yarn detected by said breakage surveying device, said timing circuit being actuated by said signals respectively for spaced periods, said periods being limited by said timing circuit and less than the average period required for each said bobbin to unwind, and said timing circuit applying signals corresponding to said periods to said gate, whereby said gate passes pulse signals corresponding only to gaps in said periods due to yarn breakages, and a counter for counting said pulse signals.

3,995,418

DOUBLE TWIST SPINDLE YARN STOP DEVICE

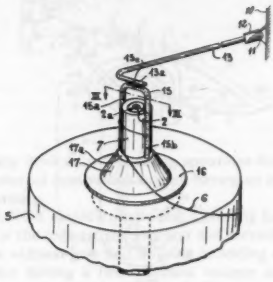
Rene Neyraud, Saint Cyr au Mont d'Or, France, assignor to Verdol S.A., Caluire (Rhone), France

Filed Aug. 5, 1975, Ser. No. 602,038

Claims priority, application France, Aug. 12, 1974, 74.28643

Int. Cl.² D01H *13/16*

U.S. Cl. 57—80 **4 Claims**



1. In a thread twisting machine of the type having a hollow spindle for supporting a bobbin and having a free end extending beyond the bobbin, and the machine having feed means for continuously drawing a thread from the bobbin through the free end of said hollow spindle, and the machine having a vertically swingable thread feeler lever arm having an outer end normally supported above the spindle by the thread being drawn from the bobbin but dropping down toward the spindle to a lowered position in the event the thread breaks, an improved device for stopping unwinding of the thread when it has broken, comprising: a centering tip around the free end of the spindle and resting on the bobbin; and a bifurcated stirrup fixed to the outer end of the lever arm and opening downwardly, the stirrup being positioned on the lever arm so that when the arm is in lowered position, the stirrup overlies the free end of the spindle.

3,995,419

EAR-SHAPED RING TRAVELERS FOR YARN TWISTERS

Robert L. Goerens, Esch sur Alzette, Luxembourg, assignor to Uniroyal Luxembourg S.A., Steinfort, Luxembourg

Filed June 19, 1975, Ser. No. 588,252

Claims priority, application Germany, Apr. 7, 1975, 2515097

Int. Cl.² D01H *7/60*

U.S. Cl. 57—125 **9 Claims**

1. An ear-shaped ring traveler designed for movement in only one given direction along a ring of a yarn twister or like machine,

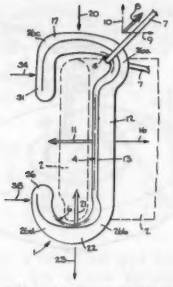
a. said traveler having a main body section, first and second transition sections at the opposite ends of said main body section, respectively, first and second arms extending generally codirectionally from said first and second transition sections, respectively, third and fourth transition sections at the ends of said first and second arms remote from said main body section, respectively, and first and second hook-like ends extending mutually inwardly toward one another from said third and fourth transition sections, respectively,

b. of which, when the traveler is in use, said main body section extends generally vertically across and moves translationally along the inside face of the ring, said first and second arms extend generally horizontally outwardly

across and move translationally along the upper and lower edges of the ring, respectively, said first and second hook-like ends extend downwardly and upwardly, respectively, over and move translationally along the outside face of the ring, and said first transition section at its inside surface defines a guide for the yarn being twisted,

c. said traveler having aerodynamically streamlined cross-sectional contours throughout,

d. the cross-sectional configuration of any part of said traveler on a transverse plane perpendicular to the longitudinal dimension of the respective part being generally oblong in shape and having, as viewed with reference to said given direction of movement, a relatively blunt leading edge and a relatively less blunt trailing edge,



e. said cross-sectional configuration of said main body section being airfoil-shaped and oriented, with reference to said given direction of movement, so as to generate, when the traveler is in use, a lift force directed oppositely to and counteracting the centrifugal forces exerted on said traveler, thereby to urge said main body section out of frictional engagement with the inside face of the ring, and

f. said cross-sectional configuration of each of said arms being airfoil-shaped and oriented, with reference to said given direction of movement, so as to generate respective codirectional lift forces directed downwardly with respect to the ring oppositely to and counteracting the upward component of the yarn force, thereby to urge said lower arm out of frictional engagement with the lower edge of the ring.

3,995,420

HIGHLY ELASTIC SYNTHETIC CRIMP YARN WITH LOW RESIDUAL LATENT CRIMP AND PROCESS FOR PRODUCING SAID YARN

Helmut Ohse, Zons; Wolfgang Müller, Dormagen-Hackenbroich; Walter Hofmann, Dormagen, and Jürgen Walther, Dormagen-Delhoven, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

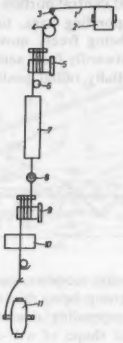
Filed Oct. 15, 1974, Ser. No. 514,998

Claims priority, application Germany, Oct. 19, 1973, 2352517

Int. Cl.² D02G 3/26, 1/02, 3/32

U.S. Cl. 57—140 R **8 Claims**

8. Highly elastic crimp yarn of synthetic endless filaments, having a residual shrinkage of 6 to 7%, a latent crimp of at least 80%, a crimp stretchability of at least 230%, a crimp



stability of at least 60% and a crimp contraction force of 8 to 10 mp/dtex.

3,995,421

METHOD OF INCREASING THE OUTPUT OF HYDROGEN COMBUSTION TYPE INTERNAL COMBUSTION ENGINE BY RECOVERY OF GENERATED HEAT AND APPARATUS THEREFOR

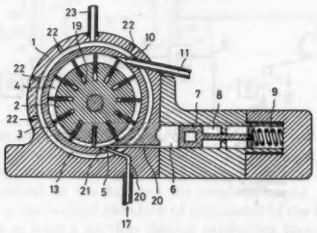
Sajio Kuroiwa, 24-15, Nishikuma, Kochi, Kochi, Japan

Filed Nov. 26, 1974, Ser. No. 527,425

Claims priority, application Japan, Nov. 30, 1973, 48-135178

Int. Cl.² F02C 7/00, 3/24

U.S. Cl. 60—39.46 R **9 Claims**



1. An apparatus for improving the output of a hydrogen combustion type internal combustion engine by recovery of generated heat, which comprises: an engine casing defining an engine chamber adapted to be separated from the atmosphere; a rotor rotatably supported therein and defining an annular space between the circumferential surface of said rotor and the inner surface of said engine chamber; a plurality of vane members projecting radially outwardly from the outer circumference of said rotor and slidably sealing against the interior wall surface of said engine chamber for partitioning said annular space; at least one cylinder spaced from said engine chamber and defining a combustion chamber; a cushioning piston reciprocally movable within said cylinder for adjusting the volume of said combustion chamber and accommodating the pressure formed therewithin, said cylinder having a rear cylinder space on the opposite side of said cushioning piston from said combustion chamber; means on said cylinder for supplying hydrogen gas and oxygen containing gas to said combustion space and ignition means on said cylinder for causing said hydrogen gas to be combusted within said combustion chamber, thereby producing water vapor therefrom; means on said cylinder for supplying water in a form no more volatile than water vapor of a low temperature for pro-

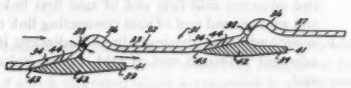
ducing water vapor by absorbing heat generated from said combustion of said hydrogen gas within said combustion chamber; the end of said cylinder having said combustion chamber therein being connected to said engine chamber for directing the water vapor obtained from said combustion chamber into said annular space within said engine chamber for rotating said rotor by the combined jet energy and expansion energy of the thus obtained water vapor; exhaust means opening out of said annular space for exhausting said water vapor from said engine chamber after it has rotated said rotor within said engine chamber; a wall encircling said engine casing and defining a space therearound shut off from the atmosphere; means on said wall for supplying water in a form no more volatile than water vapor at a low temperature into said space for cooling down said engine casing and producing a secondary water vapor and thereby absorbing the heat generated in said engine casing; means coupled between said wall and said cylinder for directing secondary water vapor generated within said space out of said engine casing and introducing it into said rear cylinder space; and means coupled between said cylinder at a point adjacent the rear side of said piston at its position closest to said engine casing and said engine casing for supplying said secondary water vapor to said annular space in said engine casing; whereby the secondary vapor exerts a pressure on said cushioning piston which is added to the pressure of the water vapor in the combustion chamber to increase the energy of the water vapor in the combustion chamber as it is ejected into said annular space in said engine casing, and the secondary water vapor after it has exerted its pressure on said cushioning piston is conducted to said annular space in said engine casing to act on the rotor directly, thereby increasing the output power of said engine.

3,995,422

COMBUSTOR LINER STRUCTURE

Edward I. Stamm, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed May 21, 1975, Ser. No. 579,309
Int. Cl.² F02C 7/18
U.S. Cl. 60—39.66 **18 Claims**



1. A method of fabricating a liner defining an internal combustion chamber and adapted to be surrounded by a plenum having an axial flow of cooling fluid therein, comprising:

a. forming a continuous outer shell of axially successive patterns comprising in serial connection, an axial portion, a transition portion extending outwardly into the plenum, and an entrant portion having a plurality of aperture means for providing fluid communication between said plenum and said combustion chamber; and

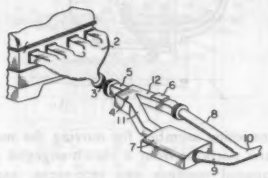
b. attaching to the inner surface of each of said transition portions, a slip extending in a general downstream direction to define the inner boundary of a cooling slot which directs the flow of cooling air along the inner surface of said axial portion, said lip being of an increased thickness at an intermediate section thereof sufficient to allow it to resist thermal stresses which result from cooling film decay along its length, so as to thereby prevent said cooling slot from narrowing towards its downstream end.

3,995,423

SAFETY DEVICE FOR USE IN AN APPARATUS FOR CLEANSING THE EXHAUST GAS IN AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, and Kenji Goto, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 509,913, Sept. 27, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 655,778
Claims priority, application Japan, July 26, 1974, 49-85062
Int. Cl.² F01N 3/15
U.S. Cl. 60—288 **3 Claims**



1. A safety device for a cleaning apparatus for the exhaust gas in an internal combustion engine having an exhaust manifold, comprising:

a. an OR-NOR amplifier including a housing having an inlet port for the exhaust gas and first and second outlet ports for the exhaust gas, said housing providing a first vortex chamber having a first effective volume and a second vortex chamber having a second effective volume different from said first effective volume, said inlet port communicating the exhaust gas from the exhaust manifold with said first and second chambers;

b. a first passage including the cleaning apparatus for the exhaust gas, said first outlet port communicating said first vortex chamber with said first passage and the upstream end of the cleaning apparatus for the exhaust gas; and

c. a second bypass passage for the exhaust gas, said second outlet port communicating said second vortex chamber with said bypass passage, said bypass passage including mechanical two-way valve means movable between two positions for opening or closing said bypass passage and for changing the flow route of the exhaust gas from said first vortex chamber and said first outlet port to said second vortex chamber and said second outlet port, said first passage downstream of the cleaning apparatus and said bypass passage downstream of said valve means meeting one another to form a part of an exhaust pipe.

3,995,424

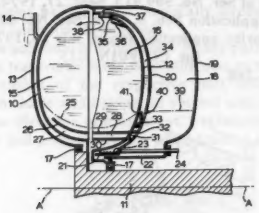
FLUID CLUTCHES

John E. Becker, Bowmanville, Canada, assignor to Charan Associates Ltd., Oshawa, Canada

Filed Jan. 16, 1975, Ser. No. 541,464
Claims priority, application United Kingdom, Jan. 28, 1974, 3810/74
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² F16D 33/04
U.S. Cl. 60—349 **8 Claims**

1. A fluid clutch comprising power input and power output means, a pump element and a turbine element connected respectively to the power input and power output means for rotation thereby and providing respectively cooperating pump and turbine chambers rotatable about the same axis and constituting a working chamber, a quantity of working liquid in the working chamber, each element comprising a respective annular shell and a respective set of radially-extending vortex producing vanes, the pump element comprising another annular shell axially spaced from and rotatable with the respective element shell to form a corresponding stall reservoir compartment therebetween, at least some of the vanes of the pump

element being connected by a respective connecting member which is mounted for movement within the stall reservoir compartment for movement of the vanes or vane portions connected thereto into and out of vortex-producing operative cooperation with the set of turbine vanes, means connected to



the said connecting member for moving the movable pump vanes or vane portions from a clutch-engaged position to a clutch-disengaged position and vice-versa, and means for automatically feeding fluid from the working chamber upon the existence of a stall condition of the turbine element relative to the pump element.

3,995,425

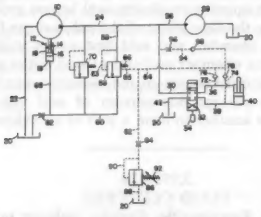
DEMAND COMPENSATED HYDRAULIC SYSTEM WITH PILOT LINE PRESSURE-MAINTAINING VALVE

Richard Arthur Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 8, 1976, Ser. No. 664,569

Int. Cl.² F16H *39/46*; F15B *13/06*

U.S. Cl. 60—445 **6 Claims**



1. An improved hydraulic system of the type having a variable displacement pump with an output control means biased to increase pump output and responsive to an input of pressurized fluid to decrease pump output, a fluid motor, a pressurized output line connected between the pump and the motor, a motor control valve interposed in the output line for selectively opening and closing the output line, a control line connected between the pump and output control means, demand valve means interposed in the control line for selectively opening and closing the control line to allow and block the input of pressurized fluid to the output control means in response to differences in the pressure of pressurized fluid between the control line and a pilot line connected to the demand valve means, said pilot line further connected to the output line between the motor control valve and the motor, and a restricted reservoir line leading from said pilot line to a fluid reservoir, wherein the improvement comprises: pressure control means connected to said pilot line for maintaining a predetermined fluid pressure therein.

3,995,426

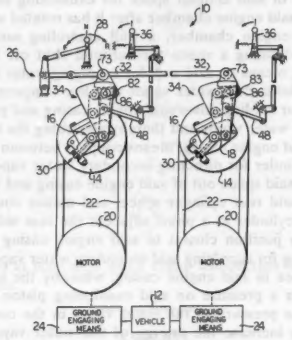
MECHANICAL LINKAGE FOR HYDROSTATIC CONTROL SYSTEM

Cyril William Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1975, Ser. No. 633,352

Int. Cl.² F15B *13/09*

U.S. Cl. 60—486 **7 Claims**



1. In a control system for a hydrostatic drive of a vehicle comprising a pair of hydrostatic pumps the output of each of which is controlled by an arm extending from servo valve means mounted thereon, the fluid output of each pump powering a respective hydraulic motor which drives a respective ground engaging means of said vehicle, an improved mechanical arrangement for controlling the steering and speed function of said system, comprising:

A. a pair of pump adjusting means, one communicating with each of said pumps, each adjusting means comprising:

1. a first crank having a first end and a second end, pivotally mounted intermediate said ends adjacent a respective one of said pumps;
2. steering linkage means drivingly linked adjacent the first end of said first crank;
3. connecting link means drivingly linked adjacent a first end thereof adjacent the second end of said first crank;
4. first linkage means drivingly linked adjacent its first end adjacent a second end of said connecting link means and drivingly linked adjacent its second end to said arm of said servo valve;
5. second linkge means drivingly linked adjacent its first end adjacent said first end of said first linkage means and said second end of said connecting link means; and
6. a second crank drivingly linked adjacent its first end adjacent a second end of said second linkage means; and

B. tying means drivingly mounted adjacent a second end of each of said second cranks linking their movement.

3,995,427

MULTIPLE-PHASE COMBUSTION ENGINE EMBODYING HYDRAULIC DRIVE

Mihai C. Demetrescu, Irvine, Calif., assignor to Resonance Motors, Inc., Monrovia, Calif.

Filed May 15, 1975, Ser. No. 577,801

Int. Cl.² F02B *71/04*

U.S. Cl. 60—595 **18 Claims**

1. A motive system powered by combustible fuel, comprising:

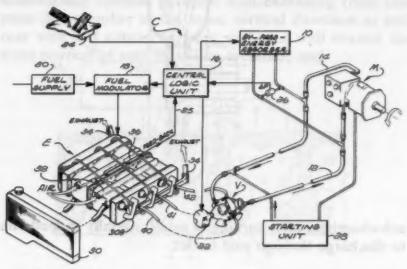
block means defining at least one pair of combustion working chambers for said fuel, and at least one pair of hydraulic working chambers;

piston means including combustion piston means in said combustion working chambers and rigidly rectilinearly

inter-coupled hydraulic piston means in said hydraulic working chambers;

elastic force means interposed between said piston means and said block means, said elastic force means and said piston means defining a mechanically resonant system;

hydraulic port means coupled to said hydraulic working



chambes to provide and receive oscillatory hydraulic energy;

control means for supplying and burning fuel in said combustion chambers for driving said mechanically resonant system at its frequency of mechanical resonance and for maintaining said resonance during periods of varying power demand.

3,995,428

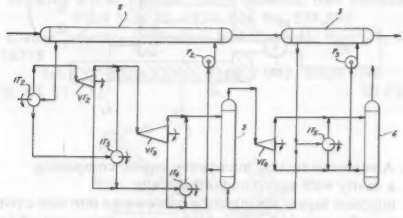
WASTE HEAT RECOVERY SYSTEM

Edward S. Roberts, 214-05 33rd Ave., Bayside, N.Y. 11361

Filed Apr. 24, 1975, Ser. No. 571,212

Int. Cl.² F03G *7/00*

U.S. Cl. 60—641 **10 Claims**



1. A process of heat recovery and energy production which comprises multistage expansion of a working fluid, in at least one stage of which saturated liquid is expanded to a two-phase mixture in a hot liquid turbine with parallel vapor expansion in a vapor expander, the expansion in said hot liquid turbine between substantially the same limits of temperature and pressure as in the expansion in said vapor turbine.

3,995,429

APPARATUS FOR GENERATING POWER USING ENVIRONMENTAL TEMPERATURE DIFFERENTIALS

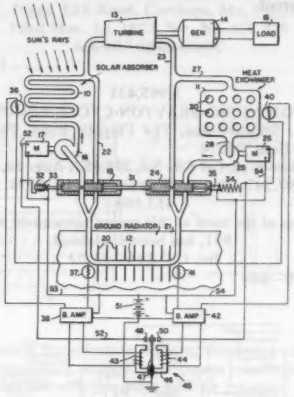
Melville F. Peters, Livingston, N.J., assignor to Walter Todd Peters; Margot Elizabeth Peters, both of East Dennis, Mass. and Albert F. Kronman, Locust Valley, N.Y.

Filed July 14, 1975, Ser. No. 595,570

Int. Cl.² F01K *25/10;* **F03G** *7/02*

U.S. Cl. 60—641 **10 Claims**

1. Apparatus for generating fluid vapor pressure for the operation of a vapor engine comprising at least three heat sources of variable temperature, a fluid selectively circulated between the heat sources, sensing means for determining the greatest temperature differential between the heat sources, valve means for connecting fluid to any two of the heat sources having the greatest temperature differential to provide



a closed cycle system for the transfer of heat from the one source to the other, pumping means for forcing fluid through the system to a heat source, a power transducer connected to a heat source which vaporizes a fluid.

3,995,430

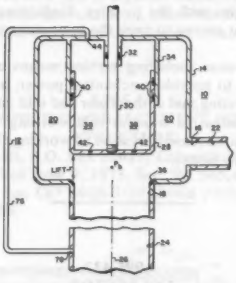
VALVE NOISE SUPPRESSION BY FLUID RECIRCULATION

Delmer Q. Hoover, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1975, Ser. No. 563,422

Int. Cl.² F01B *31/00*

U.S. Cl. 60—657 **7 Claims**



5. In a steam turbine power plant having a steam generator element connected to a turbine element and providing motive fluid therefor, a flow control apparatus for modulating the pressure of said motive fluid disposed between said steam generator element and said turbine,

said flow control apparatus comprising a casing having an inlet port connected to said steam generator, an outlet port connected to said turbine by an outlet pipe, a valve plug movably disposed within said casing, said plug having a cavity disposed therein and having a bore extending therethrough through which said cavity communicates with a region of said outlet pipe immediately beneath said valve plug, and wherein said improvement comprises

means for conducting fluid into said plug cavity from a region having a pressure therein higher than the pressure of said motive fluid flow passing from said steam generator to said turbine benath said plug.

said fluid conducted into said plug cavity passing through said bore into said motive fluid flow beneath said plug to intermix with said motive fluid flow to dissipate the velocity thereof.

3,995,431

COMPOUND BRAYTON-CYCLE ENGINE

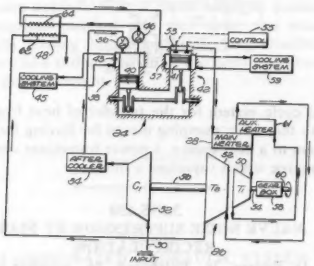
Everett H. Schwartzman, 724 Cloyden Road, Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 279,552, Aug. 10, 1972, Pat. No. 3,797,247. This application Mar. 18, 1974, Ser. No. 452,168

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² F01K 25/02

U.S. Cl. 60—684 10 Claims



1. An engine system for providing mechanical power from heat energy, comprising:

positive displacement means including a positive displacement compressor and a positive displacement engine for driving said compressor;

means in series with the positive displacement means for adding heat energy to raise the temperature of a working fluid;

a rotating system including turbine means adapted to be connected to provide mechanical power; and

means connecting said compressor and said engine with said rotating system to transfer said working fluid therebetween at an increased pressure of working fluid applied to said turbine means.

3,995,432

COLLECTOR

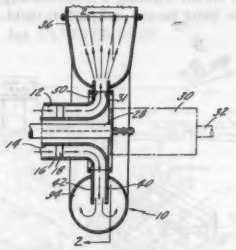
Leonard Noryk, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1975, Ser. No. 599,559

Int. Cl.² F01D 25/30

U.S. Cl. 60—697 5 Claims

1. A collector for a gas producer for collecting and diverting the gaseous discharge therefrom, said collector having wall means defining a toroidally shaped chamber having an annular inlet on the inner diameter of said wall means for receiving said gaseous discharge from a gas producer and a single outlet opening on the outer diameter of said wall means for discharging the collected gases, means for increasing the flow into and out of said toroidally shaped chamber including a pair of plate elements extending radially from opposite sides of said annular inlet to said wall means but terminating radially short of the wall means at the junction point opposite said outlet said spaced plate elements defining three sub-chambers communicating with said single outlet whereby the gaseous discharge from said inlet is directed between said plate-like elements forming one of said sub-chambers into both of said other



sub-chambers after turning in said toroidally shaped chamber to discharge through said outlet.

3,995,433

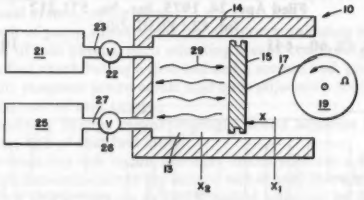
SUPERCONDUCTING APPARATUS FOR CONVERTING MICROWAVES INTO WORK

G. John Dick, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 606,160, Aug. 20, 1975. This application May 3, 1976, Ser. No. 682,810

Int. Cl.² F03G 7/00

U.S. Cl. 60—721 10 Claims



1. A superconducting microwave engine comprising:

a. a cavity with superconducting walls;

b. injection means for injecting microwaves into said cavity;

c. transfer means for transferring microwaves out of said cavity;

d. said cavity being deformable;

e. derivation means for deriving work from the deformation of the cavity; whereby

f. microwaves are injected into said cavity by said injection means, said cavity is deformed by said microwaves resulting in a decrease in the energy state of said microwaves, work is derived from said cavity deformation by said derivation means, whereupon said microwaves are transferred out of said cavity by said transfer means.

3,995,434

WAVE DISSIPATING WALL

Hisanori Kato, Tochigi, and Hiroshi Okamoto, Kamiinayo, both of Japan, assignors to Nippon Tetrapod Co., Ltd., Tokyo, Japan and Robert Q. Palmer, Las Vegas, Nev.

Filed July 29, 1975, Ser. No. 600,008

Claims priority, application Japan, Aug. 8, 1974, 49-90300

Int. Cl.² E02B 3/06

U.S. Cl. 61—4 16 Claims

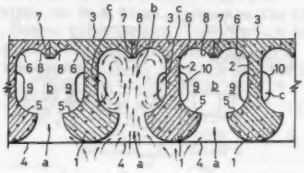
10. A wave dissipating wall according to claim 1 wherein said chamber defining means comprises a plurality of blocks

adapted to be located horizontally and vertically adjacent each other, each block comprising:

a substantially horizontal plate-like member having front and rear portions;

a rear wall portion extending substantially vertically from the rear portion of said plate-like member;

a substantially vertical partition wall extending from said plate-like member in the same vertical direction as said rear wall and extending from said rear wall toward the front portion of said plate-like member; and



a front pillar at said front portion of said plate-like member and extending substantially vertically from said plate-like member in the same direction as said rear wall and partition wall, said front pillar having a width in a direction perpendicular to the running direction of said partition wall which is less than the width of the rear wall, the plate-like member having substantially the same width as that of the rear wall, said horizontal plate-like member, said front pillar, said partition wall and said rear wall being integrally formed.

3,995,435

FLUID FLOW CONTROL MEANS

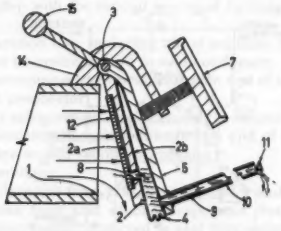
William Waterston, Dunedin, New Zealand, assignor to G. Methven & Co., Limited, South Dunedin, New Zealand

Filed May 21, 1975, Ser. No. 579,594

Claims priority, application New Zealand, Nov. 27, 1974, 174375

Int. Cl.² E02B *13/00;* F16K *17/12;* E02B *7/40*

U.S. Cl. 61—12 22 Claims



1. Fluid flow control means comprising a flap member mountable across the flow path of the fluid which is to be controlled, and movable to effect control of said flow, at least one collapsible member defining a collapsible chamber and arranged to act on said flap member, said chamber having an inlet means in flow communication with the upstream flow and an outlet means arranged to enable the fluid flow leaving the chamber to be greater than the fluid flow into the chamber, secondary control means actuable to close off said outlet in response to the existence of a predetermined amount or level of fluid at a predetermined position downstream of said flap member, so that fluid is able to accumulate in the chamber and the accumulated fluid is able to act on an adjacent face of said flap member and to move said flap member to a position closing off or substantially retarding said fluid flow.

3,995,436

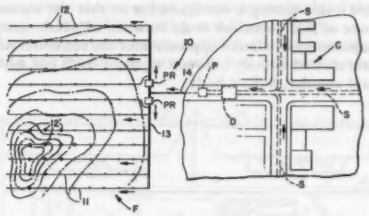
APPARATUS FOR UNIFORM DISPERSION OF DIGESTED EFFLUENT

Richard E. Diggs, 12A Road, Carthage, Mo. 64836

Filed Mar. 13, 1975, Ser. No. 558,079

Int. Cl.² E02B *13/00*

U.S. Cl. 61—13 8 Claims



1. Apparatus for effecting uniform dispersion of digested effluent, comprising header pipe means connected with a source of digested effluent under positive pressure, a plurality of effluent discharge pipes each connected at one of their ends with the header pipe means and extending therefrom in generally perpendicualar relation to the header pipe means into an area for discharge of the effluent, and a plurality of separate flow control emitters individually connected with the discharge pipes at selected, spaced apart locations along the length of the discharge pipes, said emitters having a piercing point on one end thereof penetrating the discharge pipes and connecting the emitters to the discharge pipes and having an exterior tubing connecting surface on the other end thereof for engagement thereover of an end of a tube to attach the tube thereto, elongate tubes engaged at one end with the tubing connecting surface on selected emitters for receiving flow from the emitters, said emitters having individual, predetermined, various size flow control orifices therethrough to obtain a desired flow rate of digested effluent from each emitter, said apparatus thus usable on either flat or hilly terrain to obtain a uniform dispersion of digested effluent.

3,995,437

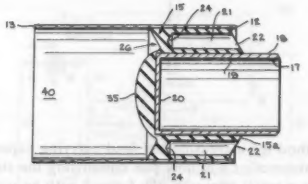
SHOCK ABSORBING ARRANGEMENT FOR A MARINE STRUCTURE

Glen E. Drewett, P.O. Box 52627, Lafayette, La. 70501

Filed June 9, 1975, Ser. No. 585,427

Int. Cl.² E02B *3/20;* B60R *19/08*

U.S. Cl. 61—86 4 Claims



1. A shock absorbing arrangement for marine structures comprising:

a. an annular, elongated hollow body;

b. an elastomer body molded in said hollow body adjacent one end thereof;

c. a cylinder molded centrally of and extending longitudinally of said elastomer body;

d. said cylinder having one end projecting beyond one end of said elastomer body and having a closed end positioned

in spaced relation to and adjacent the other end of said elastomer body;

e. said elastomer body having a plurality of voids circumferentially spaced about said cylinder, said voids each having an open end facing toward the cylinder end which projects beyond said one elastomer end and terminating in spaced relation to the other end of said elastomer body to form a closed end on said void; and

f. said voids having a configuration so that the circumference of said elastomer body between adjacent voids and adjacent said cylinder approximates the circumference of said elastomer body between adjacent voids and adjacent said annular, hollow body.

3,995,438

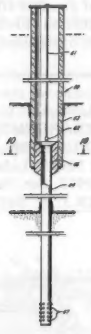
METHOD FOR INCREASING THE LOAD CARRYING CAPACITY AND PULL-OUT RESISTANCE OF HOLLOW PILES

Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 401,778, Sept. 28, 1973, Pat. No. 3,874,181, which is a division of Ser. No. 247,584, April 26, 1972, Pat. No. 3,795,035. This application Nov. 4, 1974, Ser. No. 520,709

Int. Cl.² E02D 5/44

U.S. Cl. 61—53.68 **1 Claim**



1. A method for increasing the load carrying capacity and pull-out resistance of a hollow pile comprising the steps of,

a. driving a metal concrete pile formed with an upper hollow concrete portion securely connected to a malleable lower portion into the ground to the desired depth,

b. lowering a multiple piston swag inside the pile into the lower malleable portion,

c. swaging a plurality of anchor bumps simultaneously in the pile to form a plurality of horizontal rows of anchor bumps on the pile peripheral external surface, and

d. swaging the plurality of anchor bumps of the plurality of horizontal rows likewise simultaneously into vertical rows of anchor bumps for forming a new high load carrying, pull-out resistant, composite metal concrete pile.

3,995,439

DEVICE FOR EMBEDDING OBJECTS SUCH AS CONTINUOUS PIPES INTO WATER BOTTOMS

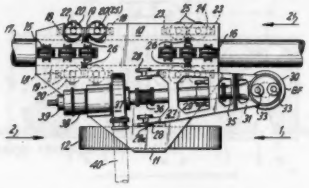
Udo Hahlbrock, Hannover, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Germany

Filed Mar. 3, 1975, Ser. No. 554,662

Claims priority, application Germany, Mar. 8, 1974, 2411140

Int. Cl.² E02F 5/06

U.S. Cl. 61—72.4 **15 Claims**



1. A device for embedding objects such as continuous lengths of pipes on water bottoms, comprising a support frame, a single drive track carried by said support frame along one side and engageable with the water bottom to advance said frame along the bottom, pipe drive roller means on said frame spaced laterally of said drive track and including at least one drive roller frictionally engageable with the object to be embedded for advancing said frame therealong as said drive track moves said frame relative to the water bottom, and a bottom trenching device carried on said frame and being engageable in the water bottom to form a trench for the object to be embedded as said frame is advanced along said bottom and said object.

3,995,440

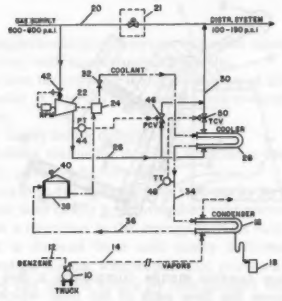
VAPOR CONTROL SYSTEM

George E. Wengen, New Castle, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Dec. 24, 1975, Ser. No. 644,210

Int. Cl.² F17C 7/02

U.S. Cl. 62—54 **17 Claims**



1. A system for reducing pollution of the atmosphere by chemical vapors within a chemical handling area having a supply of gas at a relatively high pressure which requires expansion to a lower pressure, and comprising:

a. means for containing the chemical vapors to prevent their being vented into the atmosphere;

b. a condenser having the contained chemical vapors directed thereto and adapted to cool and condense the chemical vapors;

c. a coolant adapted to flow through and cool the condenser;

d. a pump for circulating the coolant through the system;

e. a turbine means, powered by said high pressure gas, for driving said pump and adapted to release the gas at a lower usable pressure and lower temperature due to the expansion of the gas through the turbine means; and

f. a heat exchanger means for cooling said coolant with said lower temperature gas, whereby the expansion of the gas from a higher to a lower pressure is utilized to both drive and cool the system.

3,995,441

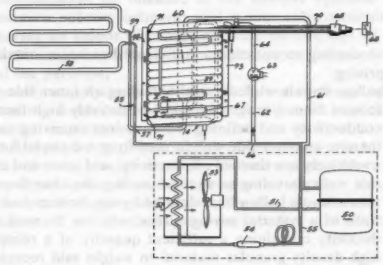
BEVERAGE DISPENSING SYSTEM

John R. McMillin, St. Paul, Minn., assignor to The Cornelius Company, Golden Valley, Minn.

Division of Ser. No. 389,808, Aug. 20, 1973, Pat. No. 3,898,861. This application July 15, 1975, Ser. No. 596,174

Int. Cl.² F25D *17/00;* **G05D** *23/12*

U.S. Cl. 62—177 **14 Claims**



1. A refrigeration system for first and second sources of beverage ingredient, comprising:

a. a condensor;

b. a refrigeration compressor having a discharge connection to said condensor;

c. a first evaporator adapted to be in heat exchange relationship with the first source of beverage ingredient;

d. a second evaporator adapted to be in heat exchange relationship with the second source of beverage ingredient;

e. a refrigeration line, including a first capillary tube, connected at its upstream end to said condensor;

f. a valve interconnecting the downstream end of said line to said first evaporator;

g. a further refrigeration line, including a second capillary tube, interconnecting said downstream end of said first-named line to said second evaporator;

h. an accumulator;

i. a first suction line from said first evaporator and a second suction line from said second evaporator, both of said suction lines being connected to said accumulator, and a further suction line from said accumulator to said compressor; and

j. thermostatic control means adapted to sense the temperature of beverage ingredient in the first source, and connected to actuate said valve and said compressor.

3,995,442

AIR CONDITIONING UNIT

Norman A. Cavezza, San Ramon, Calif., assignor to Fraser-Johnston Company, San Lorenzo, Calif.

Filed Sept. 29, 1975, Ser. No. 617,617

Int. Cl.² F25D *23/12*

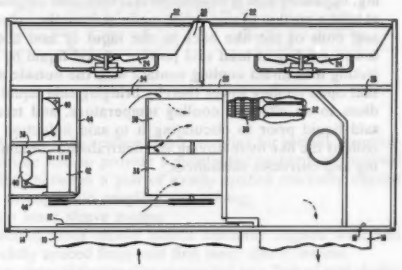
U.S. Cl. 62—259 **4 Claims**

1. An air conditioning unit for installation externally of the space to be conditioned, comprising:

an outer housing;

interior partition means defining separate compartments within said outer housing including a first compartment containing a refrigerant condenser and fan means therefor, a second compartment containing heat exchanger means including refrigerant evaporator means, a third compartment containing belt-driven blower means connected to cause air flow through said second compartment, and a fourth compartment containing refrigerant compressor means and an electric motor having a shaft at one end thereof for driving said blower means;

said interior partition means including a wall separating said third and fourth compartments, said wall having a motor



shaft opening therein larger in diameter than said motor shaft;

means for securing said motor to said wall to support it in cantilever fashion therefrom with said motor shaft projecting through said wall opening, said securing means being releasable to permit shifting said motor toward and away from said blower means to adjust belt tension to the proper degree, said wall opening being sized to permit said shifting of said motor to obtain the proper belt tension without uncovering the closure of said opening obtained by the overlying relation of said motor to said opening.

3,995,443

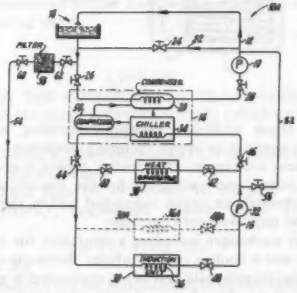
AIR CONDITIONING SYSTEM

Rudolf O. Iversen, 151 West Blvd., East Rockaway, N.Y. 11518

Continuation of Ser. No. 537,921, Jan. 2, 1975, abandoned. This application Apr. 24, 1975, Ser. No. 571,087

Int. Cl.² F28D *5/00*

U.S. Cl. 62—305 **11 Claims**



1. In an air conditioning process for cooling the interior of a building which includes circulating chill water through induction unit coils or the like in a closed conduit circuit in the interior of said building to remove heat by heat exchange from

the air within said building, utilizing a refrigeration machine to continuously remove the heat from said chill water picked up during said heat exchange process to maintain said chill water at the desired cooling temperature, and cooling said refrigeration machine by circulating a second liquid in a separate open conduit circuit having an air cooling tower to cool said liquid, the improvement which comprises:

providing a single aqueous liquid medium and, when the wet bulb temperature of the outside ambient air is low enough to cool said liquid to an effective cooling temperature, circulating said liquid medium directly from the output of said cooling tower to the input of and through said induction unit coils or the like in the interior of the said building, bypassing said refrigeration machine, and circulating at least a portion of said liquid medium from the output of said coils or the like back to the input of said cooling tower, cooling at least said portion of said liquid by subjecting it to direct cooling contact with the outside air in said open cooling tower thereby bringing said liquid medium to an effective cooling temperature, and treating said liquid prior to circulating it to said induction unit coils or the like by removing and neutralizing contaminating and corrosive substances.

3,995,444

ORGAN PERFUSION SYSTEM

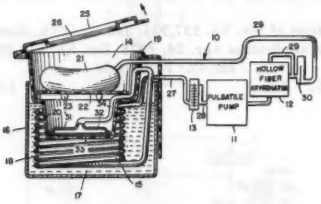
Robert A. Clark, Garden Grove, and John P. Hall, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 8, 1974, Ser. No. 522,009

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] B01F *3/04*

U.S. Cl. 62—306 7 Claims



1. An organ perfusion system comprising a chamber adapted to support an organ requiring perfusion, a pulsatile pump, a heat exchanger, and conduit means connecting the chamber, pump, and exchanger for the circulation of cold perfusate through an organ supported within the chamber, wherein the improvement comprises

said heat exchanger including a container for holding ice water and a cooling coil of tubular thermally-conductive material therein, said coil being connected in circuit with said pump and perfusion chamber for cooling perfusate circulated therethrough, said pulsatile pump being disposed downstream of said heat exchanger and upstream of said perfusion chamber for drawing cold perfusate from said coil and pumping the same in a series of regular pulses to an organ supported within said chamber.

3,995,445

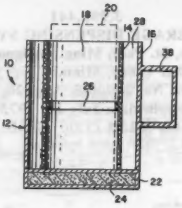
COOLING RECEPTACLE FOR INDIVIDUAL BEVERAGE CONTAINERS

George Huskins, Miami, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 14, 1976, Ser. No. 648,962

Int. Cl.[2] F25D *3/08*

U.S. Cl. 62—371 7 Claims



1. A cooling receptacle for individual beverage containers comprising:

a hollow double-walled vessel including an inner side wall formed from a material having a relatively high thermal conductivity and defining the container-receiving cavity therein, an outer side wall formed from a material having a relatively low thermal conductivity, said inner and outer side walls providing an annular cooling chamber therebetween, and a hollow base defined by top, bottom and side walls of a material having a relatively low thermal conductivity containing a sufficient quantity of a relatively high density granular material to weight said receptacle and stabilize same against inadvertant toppling;

a beverage container retaining ring secured to the inner surface of said inner side wall above said base and formed from a resilient material having a thermal conductivity lower than the material of said inner side wall;

and a detachable closure ring adapted to close the upper end of said annular chamber.

3,995,446

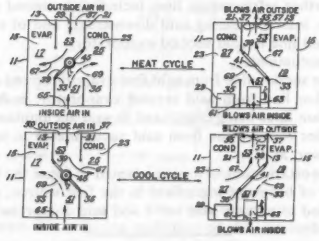
REVERSE AIR CYCLE AIR CONDITIONER

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Filed July 14, 1975, Ser. No. 595,337

Int. Cl.[2] F25B *29/00*

U.S. Cl. 62—325 10 Claims



10. A reverse air cycle air conditioning apparatus comprising:

a first compartment defining a condenser plenum;

a condenser sealed within the condenser plenum so that it divides the plenum into inlet and outlet chambers;

a first window extending along a side wall of the first compartment into both inlet and outlet chambers;

a second compartment defining an evaporator plenum;

an evaporator sealed within the evaporator plenum so that it divides the plenum into inlet and outlet chambers;

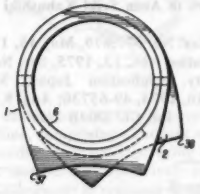
a second window extending along a side wall of the first compartment into both inlet and outlet chambers;
a third compartment located between and connecting the first two compartments;
a partition within the third compartment that divides the compartment transverse to the first and second windows;
a damper carried within the third compartment transverse to the partition, said damper having two co-acting portions, one on either side of the partition;
an outdoor subcompartment defined by a portion of the third compartment on one side of the damper; said outdoor subcompartment having an outdoor discharge aperture on one side of the partition and an outdoor suction aperture on the other side of the partition;
means for supplying air through the outdoor discharge aperture in a unidirectional flow through either the condenser or the evaporator depending on either heat or cool position;
an indoor subcompartment defined by a portion of the third compartment on the side of the damper opposite the outdoor subcompartment; said indoor subcompartment having an indoor discharge aperture on one side of the partition and an indoor suction aperture on the other side of the partition;
means for supplying air through the indoor discharge aperture in a unidirectional flow through either the condenser or the evaporator depending on heat or cool position;
said damper being pivotal about an axis transverse to the partition to provide mutually exclusive access from the condenser plunum and the evaporator plenum via the condenser window and evaporator window either to the indoor or outdoor subcompartments for cool or heat cycle.

3,995,447

ORNAMENTAL DEFENSIVE RING

Ilja Levsunov, 419E 73rd St., New York, N.Y. 10021

Filed Aug. 14, 1975, Ser. No. 604,829
Int. Cl.² A44C *9/00*
U.S. Cl. 63—1 R **15 Claims**



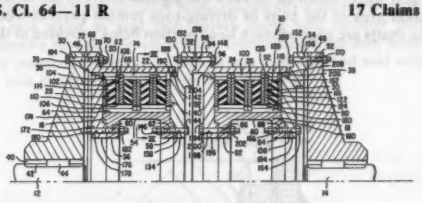
1. In a finger ring, at least first and second like ring sections each sized for wear about the finger of a wearer, first means connecting said sections in superposed contiguous relation coaxially of a common central first axis through the section openings, and for relative angular adjustment with respect to each other about said first axis, between first and second limiting positions, resilient means acting between said sections and urging the same into said second position, and latch means connected between said sections and releasably holding the same in said first position, against the urge of said resilient means.

3,995,448

TORSIONALLY RESILIENT SHAFT COUPLING

John Wright, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 12, 1975, Ser. No. 604,018
Int. Cl.² F16D *3/17*
U.S. Cl. 64—11 R **17 Claims**



1. A torsionally resilient shaft coupling for serially transmitting torque and to provide a substantial amount of torsional flexibility between a pair of axially spaced coaxially aligned shafts through said coupling comprising:
a first inner sleeve means;
a second inner sleeve means coaxially aligned with and axially spaced from said first inner sleeve means;
a first outer sleeve means connected to a first of said shafts, surrounding said first inner sleeve means and forming a first annular space therebetween;
a second outer sleeve means connected to a second of said shafts, surrounding said second inner sleeve means and forming a second annular space therebetween;
at least one first annular torsionally resilient means in said first annular space connected to said first inner sleeve means and to said first outer sleeve means to provide primary torsional flexibility between said first outer sleeve means and said first inner sleeve means;
at least one second annular torsionally resilient means in said second annular space connected to said second inner sleeve means and to said second outer sleeve means to provide secondary torsional flexibility between said second outer sleeve means and said second inner sleeve means;
a first rigid annular torque plate located axially between said first and second inner sleeve means connecting said first inner sleeve means to said second outer sleeve means for transmitting torque from said first shaft to said second outer sleeve means; and
a second rigid annular torque plate located axially between said second inner sleeve means and second shaft connecting said second inner sleeve means to said second shaft for transmitting torque from said inner sleeve means to said second shaft.

3,995,449

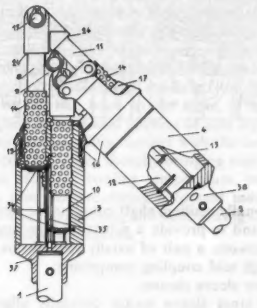
JOINT FOR THE HOMOKYNETIC TRANSMISSION OF ROTARY MOTION BETWEEN TWO CONCURRENT SHAFTS

Rene Louis Doffe, 8, Allee des Aulnes Parc de l'Aulnay, 77360 Vaires S. Marne, France

Filed June 10, 1975, Ser. No. 585,711
Claims priority, application France, June 13, 1974, 74.20613
Int. Cl.² F16D *3/28*
U.S. Cl. 64—20 **7 Claims**

1. A mechanims for the transmission of rotary motion from one shaft to another concurrent shaft comprising head portions mounted on the shafts, said head portions being formed with bores receiving driving-rods which can slide and rotate in the bores, each rod on one head portion being connected to a respective said rod on the other head portion whereby the connected rods form pairs, each pair comprises a female rod

with a strap-shaped extremity and a male rod with a tenon-shaped extremity fitted into said strap-shaped extremity, both rods of each pair being connected by an articulation axis whereby the two head portions can form an acute angle, one of the head portions comprising a central pinion meshing with a gear wheel mounted on each driving-rod whereby the articulation axes of the pairs of driving-rods remain parallel when the shafts are aligned, each head portion being provided at the

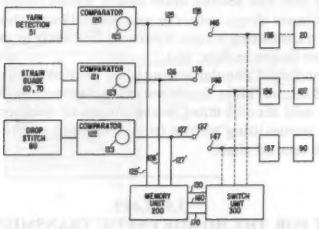


end opposite to the corresponding shaft, and externally to the pair of rods, with a coupling-box loosely mounted on an axle, the coupling-boxes being hinge-coupled by means of axes connected together by swinging-rods and disposed on two lines, the distance between centres of these two lines being equal to a diameter of a circle kaving a circumference on which the bores in a respective head portion are located, and both lines being tangential to an end of a common diameter.

3,995,450
KNITTING MACHINE PERFORMANCE REGULATING SYSTEM

Lawrence Rozett, Flushing, N.Y., assignor to The Singer Company, Elizabeth, N.J.

Filed May 8, 1975, Ser. No. 575,858
Int. Cl.² D04B 9/00
U.S. Cl. 66—8 **6 Claims**

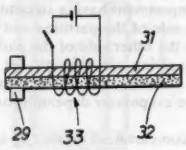


1. In a knitting machine having knitting needles operable to concatenate yarn into a knitted fabric, actuating mechanism for operating said knitting needles, a device associated with said knitting machine for varying at least one condition influencing the operation of said knitting needles to any graduated amount within a predetermined range, a detecting device on said knitting machine providing a signal which varies proportionately in response to forces incident to and resulting from the operation of said knitting needles, means for comparing said varying signal with a predetermined norm and for delivering a proportionate error signal, and control means responsive to the proportions of said error signal during continued operation of said actuating mechanism for operating said condition varying means to maintain continued operation of said knitting machine at maximum productivity.

3,995,451
PATTERNING MECHANISM

Antonius Vinnemann, Stuttgart, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Continuation of Ser. No. 239,162, March 29, 1972, abandoned. This application Apr. 17, 1974, Ser. No. 461,803
Claims priority, application Germany, Mar. 30, 1971, 2115332
Int. Cl.² D04B 15/78
U.S. Cl. 66—50 R **14 Claims**

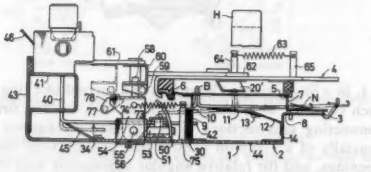


1. A knitting machine comprising at least one carrier carrying a plurality of knitting needles that may be first electrically selected and then brought from a non-knitting position into a knitting position and carrying at least one jack associated with each knitting needle, each jack being pivotally mounted between an inoperative position and an operative position; means associated with each jack for pivoting the jacks into one of said positions; actuating means for bringing into the knitting position those knitting needles which are associated with a jack in said operative position and leaving in the non-knitting position those needles which are associated with a jack in said inoperative position, at least one unilaterally fastened control spring associated with each jack for selecting the associated knitting needle, said control spring consisting of a material that may be bent or deflected between a first state and a second state by impressing an electric or magnetic field on said control springs, said control springs comprising a multilayer bimetallic element when said field is a magnetic field, each control spring being mounted such that it will only allow those jacks to be pivoted by said pivoting means into said one position when it is in said second state, means for impressing said electric or magnetic field on said control springs in accordance with a pattern to obtain the first or second states; and means for pivoting back the jacks from said one position to said other position.

3,995,452
HAND KNITTING MACHINE

Masaaki Kunisada, Anjo, and Masao Itou, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 577,679, May 15, 1975, abandoned. This application Nov. 13, 1975, Ser. No. 631,661
Claims priority, application Japan, May 24, 1974, 49-59159; June 10, 1974, 49-65730; Aug. 8, 1974, 49-91276
Int. Cl.² D04B 7/04
U.S. Cl. 66—64 **8 Claims**



1. A hand knitting machine having
a needle bed,
a series of sinkers forwardly extending from the front extremity of the needle bed and arranged in parallel with each other and at regular intervals in a plane,

a series of latch needles alternating with the sinkers and having a slide fit on the needle bed so as to project beyond the retract behind the neighboring sinkers,

an actuator movably supported on the needle bed so as to reciprocate along the longitudinal direction thereof, said actuator including a base plate, a plurality of cam means assembled on the base plate to form cam tracks to guide the latches of said latch needles upon reciprocating movement of the actuator, and

a needle selecting means including a series of needle selecting sheets extending under all the needles and laterally shiftable for selecting the needles between the operative and inoperative positions, said needle selecting sheets being formed with a series of projections at identical intervals with those of the needles on one side edge thereof for engaging the needles, control means provided on the needle bed for controlling the movement of the needle selecting sheets, and drive means operatively connected to said control means for actuating the same only when said actuator reverses the direction of travel along the needle bed, whereby said control means is actuated to laterally shift the needle selecting sheets for selecting the needles between the operative and inoperative positions.

3,995,453

ELECTRIC DEVICE FOR SELECTING THE NEEDLES OF A RECTILINEAR KNITTING MACHINE

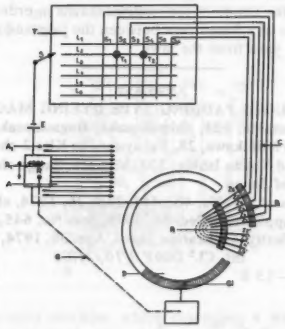
Alfred Marcel Gloeckler, Riedisheim, France, assignor to Superba, Mulhouse, France

Continuation of Ser. No. 338,845, March 7, 1973, abandoned. This application July 30, 1974, Ser. No. 493,081

Claims priority, application France, Mar. 6, 1972, 72.09732

Int. Cl.² D04B *7/00, 15/66*

U.S. Cl. 66—75 A 4 Claims



1. An electric device for selecting the needles of a rectilinear knitting machine, comprising a carriage which is displaced in front of the needles, said carriage being provided with an electro-magnetic member for successively operating the needles during its displacement in response to an electrical signal, a memory member containing data for supplying an electrical signal to activate the electro-magnetic member to operate the needles in relation to a determined width of a knitting, an installation for scanning the memory member synchronously with the displacement of the carriage, said installation including electrically conducting sectors radially distributed in circumferentially spaced apart relation, first electrical connection means electrically connecting each of said sectors to the memory member, a rotatable member adjacent said sectors mounted for rotational movement relative to said sectors, drive means rotating said rotatable member synchronously with the displacement of the carriage, said rotatable member carrying at least one electrical contact stud movable along a circular path with the rotation of said rotatable members and electrically contacting successive ones of said circumferentially spaced sectors, and a plurality of electrical contact connecting strips of different lengths, second electrical connection means electrically connecting each of said strips to the electro-magnetic member which operates the needles, and said movable contact stub being electrically connected to one of said strips as said stub moves along said circular path whereby said data is electrically transmitted from said memory member through said sectors and said stub and said strip to said electro-magnetic member.

3,995,454

NEEDLE WRAPPING DEVICE

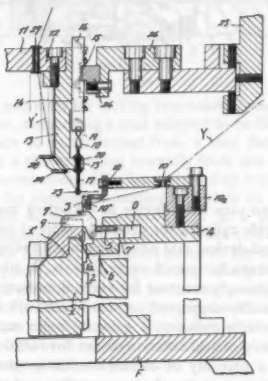
Teishichi Hayashi, Kosakai; Yoshiyasu Sakata, and Akira Mukai, both of Hamamatsu, all of Japan, assignors to Sakurai Limited, Shizuoko, Japan

Filed May 23, 1975, Ser. No. 580,409

Claims priority, application Japan, June 10, 1974, 49-67257[U]

Int. Cl.² D04B *9/32*

U.S. Cl. 66—135 1 Claim



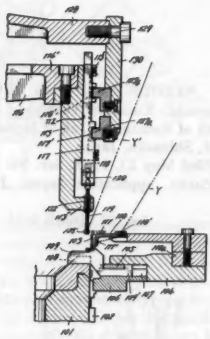
1. A pattern forming device in a knitting machine comprising a framework, a needle cylinder journalled in said framework and having a plurality of circumferentially spaced vertical slots in its periphery, knitting needles slidably received in said vertical slots for vertical movement, a rotary cylinder journalled in said framework above said needle cylinder, a pattern yarn guide cylinder integrally secured to the periphery of said rotary cylinder for rotation therewith and having a plurality of circumferentially spaced vertical slots in its periphery, pattern yarn guide pieces received in said slots of the guide cylinder for vertical movement as the rotary cylinder rotates and having notches, said guide pieces having slots at the lower ends, a cam member secured to said framework and received in said notches, said cam member having rest cams and yarn feed cams arranged in a predetermined pattern, a twisted piece loosely received in the slot of each of said pattern yarn guide pieces for rotation and having a threaded rod integrally formed therewith, and a pattern yarn guide arm connected to the lower end of said threaded rod and having a pattern yarn hole through which a pattern yarn is threaded to be fed to selected ones of said knitting needles so as to form a pattern in a ground weave being knitted.

3,995,455

NEEDLE WRAPPING DEVICE

Teishichi Hayashi, Aichi, and Yoshiyasu Sakata, Hamamatsu, both of Japan, assignors to Sakurai Limited, Shizuoko, Japan

Filed June 5, 1975, Ser. No. 584,165
Claims priority, application Japan, June 24, 1974, 49-71989; June 24, 1974, 49-37979[U]
Int. Cl.² D04B 9/32
U.S. Cl. 66—135 3 Claims



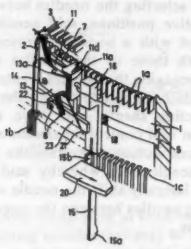
1. A pattern-yarn feed device in a knitting machine comprising a needle cylinder for rotatable support on the framework of a feed device, said needle cylinder having a plurality of circumferentially spaced vertical slots in which knitting needles are slidingly received for vertical movement, a rotary cylinder rotatably supported on said framework immediately above said needle cylinder, a guide cylinder secured to the outer periphery of said rotary cylinder for rotation therewith and having a plurality of circumferentially spaced vertical slots, at least one cam member surrounding and opposing said guide cylinder and including rest and pattern-yarn feed cams in combination, at least one guide piece received in each of said vertical slots in the guide cylinder for movement upwardly and downwardly therein as said rotary cylinder rotates and having a guide slot at the lower end, said guide piece having a notch for engaging said cam member, at least one twisted piece having an upper twisted portion and an integral threaded rod extending downwardly from said twisted upper portion for rotation as said guide piece moves upwardly and downwardly; at least one guide arm secured to the lower end of said threaded rod for rotation therewith and having a pattern-yarn guide hole whereby a pattern-yarn is guided through said guide hole in the guide arm into one or more selected knitting needles so as to form a pattern on a ground weave being formed and said guide piece having a substantially L-shape including a vertical upper portion provided at one side edge with said cam engaging notch and a lower horizontal portion extending at right angles to the upper portion and provided with a guide slot and said guide arm further has a slot between the opposite ends thereof so that the radial position of the guide piece assembly with respect to said guide cylinder can be adjusted.

3,995,456

DEVICE FOR TRAPPING FRINGE YARNS IN A CIRCULAR KNITTING MACHINE

Dennis Wright, Leicester, England, assignor to Wildt Mellor Bromley Limited, England

Filed Jan. 26, 1976, Ser. No. 652,342
Claims priority, application United Kingdom, Jan. 24, 1975, 3122/75
Int. Cl.² D04B 35/00
U.S. Cl. 66—140 R 10 Claims



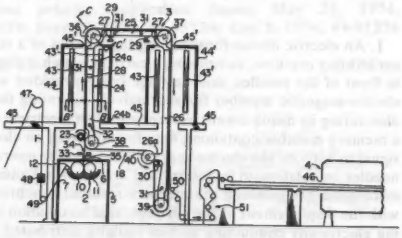
1. In a circular knitting machine comprising a needle cylinder and a needle dial, the cylinder and dial having a non-knit section, yarn feeding means, and means for severing the yarn in the non-knit section, whereby a fringe of yarns is left along the edges of the knitted fabric, the improvement comprising a device for temporarily trapping fringe yarns, the device being mounted on the needle cylinder immediately following the last needle to knit and comprising a pair of yarn gripping jaws, one jaw being fixed, the other jaw being radially movable, resilient means for urging the movable jaw into contact with the fixed jaw, and a cam-operated mechanism for temporarily moving the movable jaw out of contact with the fixed jaw against the action of the resilient means in order to allow insertion of a fringe yarn between the jaws and release of a fringe yarn from the jaws.

3,995,457

CONTINUOUS PADDING TYPE DYEING MACHINE

Shigeru Kinomoto, 621, Shimokosaka, Hagashiosaka, Osaka; Katsuyuki Nishikawa, 28, Takayasu-cho Kita 2-chome, Yao, Osaka, and Takao Ishida, 333, Mimura, Sango-cho, Ikoma, Nara, all of Japan

Continuation of Ser. No. 483,441, June 26, 1974, abandoned.
This application Dec. 30, 1975, Ser. No. 645,470
Claims priority, application Japan, Apr. 30, 1974, 49-48598
Int. Cl.² D06F 3/10, 21/00
U.S. Cl. 68—13 R 10 Claims



1. A continuous dyeing machine for fabric including a padder for padding fabric with a dye solution, a dryer for drying the padded fabric and a heat setter for setting the fabric at a high temperature, said dyeing machine comprising:
a padding bath holding a dye solution therein;

at least one main padding roller having a lower portion immersed in said dye solution in said padding bath and rotatable at a circumferential speed substantially the same as the feeding speed of the fabric, said main padding roller being adapted to pad the fabric with said dye solution while stretching said fabric widthwise;

at least one auxiliary padding roller rotatable in pressed engagement with said main padding roller and forming a nip at a level higher than the surface level of said dye solution in said padding bath for compressing the fabric therebetween to have a predetermined pick-up rate;

a pair of spaced endless conveying means movable along a path of travel of said fabric in said dryer and having a number of pin members projecting into the plane of travel of said fabric at predetermined intervals along the length thereof, said path of travel including a vertical section immediately above said padder;

a pair of roller brushes located at the lower end of said vertical section and held in contact with longitudinal edge portions of said fabric for urging the same to be pierced by said pin members of said endless conveying means; and

a pair of heat sources located on opposite sides of said path of travel for applying heat to said fabric from opposite sides thereof;

said heat setter having a heating chamber establishing a heated atmoshphere around said fabric for setting the same at a high temperature.

3,995,458

LAUNDRY MACHINE

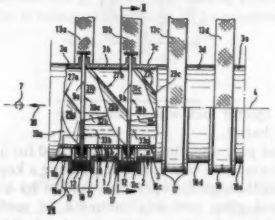
Heinz Grunewald, Bremen, and Jurgen Wellbrock, Lilienthal, both of Germany, assignors to Engelhardt & Forster, Bremen, Germany

Filed Feb. 24, 1975, Ser. No. 552,729

Claims priority, application Germany, Dec. 10, 1974, 2458338

Int. Cl.² D06F *21/04, 37/08, 37/30*

U.S. Cl. 68—140 **30 Claims**



1. A laundry machine which comprises a washing drum having a longitudinal axis and a generated surface, said drum being rotatable about said longitudinal axis, said generated surface of the drum being formed with apertures through which washing liquid can flow, a casing having an inner surface portion which is spaced apart from an outer surface of the drum to define a gap therebetween, at least one partition which extends substantially radially inside the drum thereby dividing the drum into discrete segments, any two adjacent segments having contiguous end faces defined by a respective partition formed with an aperture, conveyor means disposed inside the drum for conveying laundry from one segment of the drum to an adjacent segment thereof via the aperture in the respective partition, a flange which extends substantially radially outwardly from the respective partition, and from between each pair of adjacent segments thereof, and each partition having a flange portion extending substantially axially of the drum, said casing comprising discrete casing sections corresponding to respective drum segments, any two adjacent casing sections being interconnected at end faces thereof facing each other but being spaced from each other, the casing having projecting portions at adjacent casing sections, said flange portions extending into the respective projecting portion, thereby dividing said gap between the drum and the casing into chambers, means providing a fluid-tight seal between each flange portion and the adjacent casing projecting portions and including a sealing member in frictional contact with the radially outer surface of said flange portion, and means for supplying washing liquid to each chamber.

3,995,459

LOCK ASSEMBLIES

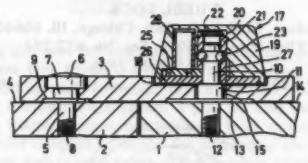
Wilfred Gwyn Weeks, and Malcolm Arthur Taylor, both of Bristol, England, assignors to Weeks and Taylor Limited, Bristol, England

Filed July 10, 1975, Ser. No. 594,616

Claims priority, application United Kingdom, July 11, 1974, 30821/74

Int. Cl.² E05B *65/48*

U.S. Cl. 70—13 **13 Claims**



1. A lock assembly for locking two relatively movable members together, comprising a stud adapted to be fixed to one of said members so as to project from a face thereof, a plate formed with a slot extending inwardly from one edge thereof and with a recess in one of its faces around an inner end of said slot, means for pivotally mounting said plate on a face of the other of said members for movement in a plane parallel thereto to engage said stud in said slot when said members are in position for locking, said recess being on the outer exposed face of said plate, and a locking member having locking means for locking it on said stud with said member engaged in said recess so that it retains said plate engaged with said stud, said locking means then allowing free rotation of said locking member on said stud while preventing the pivoting of said plate to disengage it from said stud.

3,995,460

MAGNETIC CARD KEY OPERATED DOOR LOCK STRUCTURE

Bruce S. Sedley, 7 Murray Ave., Larkspur, Calif. 94939

Filed May 30, 1975, Ser. No. 582,125

Int. Cl.² E05B *13/10, 35/14, 47/00, 63/00*

U.S. Cl. 70—210 **11 Claims**

1. In a lock structure that includes a pair of relatively rotatable members, a blocking element engageable with said members to prevent such relative rotation when said structure is locked, said element being movable from a locked position preventing such movement to an unlocked position permitting such movement;

means for actuating said structure comprising:

a housing mounted on one of said members,

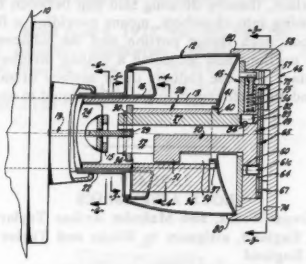
a movable block mounted in said housing and operatively connected with said blocking element,

a door knob fixedly secured to one of said members,

said other member being a plug rotatably supported in said one member,

a locking magnet in said block normally holding said block fixed relative to said housing and movable to an unlocked

position under the influence of a magnetic key inserted in said housing to allow movement of said movable block by said key



to said unlocked position thereby permitting relative rotation of said members to unlock said structure.

3,995,461

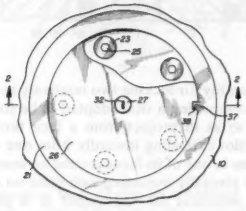
WHEEL LOCK

Kirk P. Hudson, 5248 N. Paulina, Chicago, Ill. 60640

Filed Mar. 31, 1976, Ser. No. 672,274

Int. Cl.² B60B 7/00

U.S. Cl. 70—225 10 Claims



1. A wheel lock for a vehicle wheel of the type comprising a body having a central axially inwardly depressed attachment flange surrounded by a ridge having an axially outwardly extending surface, said wheel being adapted for attachment to said vehicle by bolt means passing through said attachment flange,

said lock comprising:

a first cover plate adapted to overlie said attachment flange, with its periphery substantially in contact with said surface of said ridge;

screw means passing through said first cover plate adapted to engage the outer extremity of said bolt means;

a second cover plate in contact with said first cover plate and overlying said screw means; and

lock means passing through said first and second plates for preventing separation thereof.

3,995,462

LOCK FOR A GEAR SHIFT

George W. Boyle, 49 Garden St., Ridgefield Park, N.J. 07660

Continuation of Ser. No. 434,533, Jan. 18, 1974, abandoned.

This application Dec. 10, 1975, Ser. No. 639,936

Int. Cl.² G05G 5/00; E05B 65/12

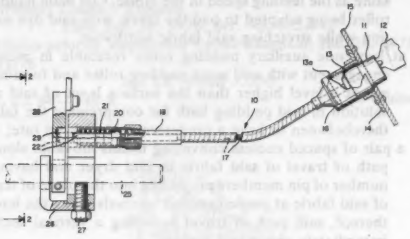
U.S. Cl. 70—247 7 Claims

1. A device for preventing the movement of a gear shift in a vehicle including a gear shift rod comprising:

a clamp for attachment to said gear shift rod and movable therewith;

a fixed arm adjacent the said clamp and provided with an aperture;

a transmission cable provided with a forward end for operative attachment to said clamp and adapted to extend into



said aperture to prevent movement of said clamp and said gear shift rod; and

means for extending said end of the cable.

3,995,463

KEY EJECTOR LOCK

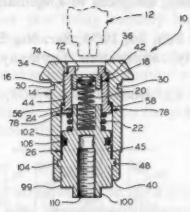
Aloysius J. Mikos, Skokie, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed July 25, 1975, Ser. No. 599,190

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² E05B 17/00

U.S. Cl. 70—388 10 Claims



1. A key ejector lock which comprises:

a tubular barrel,

a front end plug mounted for rotation and for axial reciprocal movement in said barrel and having a keyway extending therethrough for operation thereof by a key,

a rear end plug rotatably mounted in said barrel and adapted for operative connection to a locking member,

drive means interposed between said plugs and fixed to said rear end plug for rotation therewith,

means providing a sliding drive connection between said front end plug and said drive means,

means resiliently urging said front end plug forwardly in said barrel,

means on said barrel providing rearwardly opening circumferentially spaced internal notches,

lug means projecting outwardly from said front end plug, said lug means being removably received in respective ones of said notches for securing said rear end plug in respective locked and unlocked rotational positions,

a key ejector axially reciprocally movable in said barrel between said front end plug and said drive means and engaging a key inserted through said keyway.

and means resiliently urging said key ejector forwardly in said barrel,

whereby insertion of a key in said keyway serves to move said front end plug rearwardly to free the rotatable parts for rotation and enable the key to rotate said front end plug for rotating said rear end plug between said locked

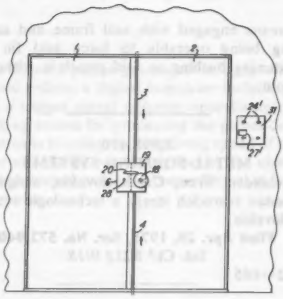
and unlocked positions thereof, and said key ejector acts to eject the key when released in any rotational position thereof.

3,995,464

DOOR LOCKING MEANS

Raymond Kenneth Henry Terry, Mayland, England, assignor to W. J. Reynolds (Equipment) Limited, England

Filed Mar. 24, 1975, Ser. No. 561,575
Int. Cl.² E05B *39/04*
U.S. Cl. 70—434 12 Claims



1. In a door-locking and release system in a building wherein a door is adapted to be held locked by a removable component, the improvement consisting in that the system includes switch means receiving said component to operate an electrical circuit inside the building, said switch means being maintained in a first switching condition when the component is received therein and in a second switching condition when the component is removed therefrom to be positioned to lock the door.

3,995,465

METHOD OF COLDWORKING METAL PIECES

George F. Felton, Jr., Chadds Ford, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 560,915, March 21, 1975, abandoned, which is a division of Ser. No. 457,040, April 1, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,580
Int. Cl.² B21J *3/00*
U.S. Cl. 72—42 7 Claims

1. In a process of cold working a metal workpiece the improvement comprising applying to the metal workpiece being cold worked a lubricant comprising:

a. 45 to 200 parts by weight of water;

b. 30 to 35 parts by weight of a block copolymer of ethylene oxide grafted on a polypropylene oxide which copolymer has both a molecular weight range and ethylene oxide content sufficient to cause the composition to remain homogeneous between ambient temperature and the boiling temperature of the composition;

c. 1 to 15 parts by weight of a potassium soap of a sulfurized naturally occurring triglyceride containing from 25 to 50 weight percent chlorine; and

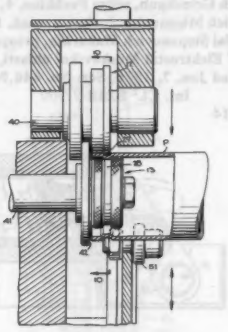
d. 0.5 to 10 parts by weight of potassium nitrite.

3,995,466

MACHINE FOR ROLL GROOVING OF PIPE

Donald R. Kunsman, Easton, Pa., assignor to Victaulic Company of America, South Plainfield, N.J.

Filed Sept. 19, 1975, Ser. No. 614,973
Int. Cl.² B21D *19/06*
U.S. Cl. 72—106 14 Claims



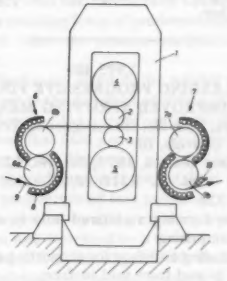
1. In a machine for rolling a circumferential groove in a pipe, of the type having a freely rotating grooving roll and a driven backup roll, hydraulic ram means for forcing said grooving roll downward against a pipe on said backup roll, vibration limiting means comprising a fluid actuated piston and cylinder coupled to means for supporting the pipe at a slight angle with respect to the axis of rotation of said backup roll, said hydraulic ram means and said fluid actuated piston being coordinated by a fluid circuit.

3,995,467

GUIDING DEVICE FOR REVERSING THE DIRECTION OF TRAVEL OF FLAT METAL MATERIAL

Edouard Bernet, Terville, Moselle, France, assignor to Societe Lorraine de Laminage Continu(Sollack) S.A., Paris, France and Maschinenfabrik Sack GmbH, Dusseldorf-Rath, Germany

Filed July 3, 1975, Ser. No. 592,751
Int. Cl.² B21B *39/08*
U.S. Cl. 72—205 7 Claims



1. A guiding device for reversing the direction of travel of flat metal material, comprising: a guide shell having a curved inner surface; and a plurality of rollers freely rotatably mounted in said guiding device to project from said curved inner surface of said guide shell, wherein said plurality of rollers occupy on said curved inner surface an area having a width which is smaller than the width of the narrowest strip of flat metal material intended to be guided by said guiding

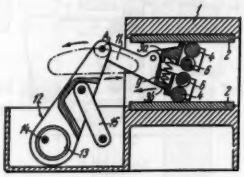
device, and wherein a smooth edge region of said curved inner surface extends unbrokenly along both sides of said area occupied by said plurality of rollers, and is free of said rollers.

3,995,468

PIPE COLD-ROLLING MILL

Mark Izrailevich Grinshpun, ulitsa Pushkina, 4, kv. 21; Vladislav Arkhipovich Mironenko, Juzhny proezd, 1, korpus 3, kv. 73, and Nikolai Stepanovich Makarkin, prospekt Lenina, 28, kv. 15, all of Elektrostal Moskovskoi oblasti, U.S.S.R.

Filed Jan. 7, 1976, Ser. No. 646,989
Int. Cl.² B21B 21/00
U.S. Cl. 72—214 4 Claims



1. A pipe cold-rolling mill the rolling stand of which comprises: a housing; longitudinal guides rigidly mounted in said housing; a carriage mounted in said longitudinal guides; a pair of backup rolls installed in said carriage with the help of which the carriage is transferred in said longitudinal guides; a pair of working rolls mounted in said carriage at both sides of the axis of a pipe to be rolled and which working rolls interact each with one of the two backup rolls and are, together with the latter, spring-actuated one with respect to the other; said stand also comprises a crank gear which connects said carriage with a drive of the mill to effect the reciprocating movement of said carriage in said longitudinal guides in the process of rolling; said crank gear is rigidly linked by its connecting rod with said carriage and is made so that during a working stroke of the carriage the shafts of said pairs of the back-up and working rolls are positioned in a plane perpendicular to said longitudinal guides, whereas during an idle stroke of said carriage said shafts are positioned in an inclined plane, as a result of which during the idle stroke of said carriage the distance between the shafts of the backup rolls is bigger than during the working stroke; at the beginning of the idle stroke of said carriage the working rolls are separated under the action of springs, while at the beginning of the working stroke of the carriage they are brought together.

3,995,469

SELF CLEANING PROGRESSIVE FIN DIE WITH IMPROVED STRIPPING MEANS

Ward A. Ames, Danville, Ill., assignor to Tridan Tool & Machine, Inc., Danville, Ill.

Filed Oct. 16, 1975, Ser. No. 623,101
Int. Cl.² B21D 22/00, 45/06
U.S. Cl. 72—328 7 Claims

1. A die for forming a collared hole in a plate type heat transfer fin comprising:

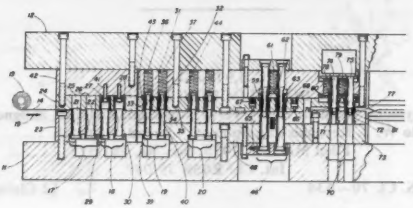
a frame including a surface for supporting said fin and a ram movable to and from said surface;

a hollow pierce bushing mounted to said frame and extendable into a bonnet of said fin;

a pierce punch mounted to said frame being extendable through said fin and into said bushing positioned in said bonnet forming a hole;

a collar straightening bushing mounted to said frame and encircling said punch with a space therebetween, said straightening bushing externally engaging and encircling said bonnet as said punch and said pierce bushing extend into and form a collar;

a stripper bushing slidably disposed between said punch and said straightening bushing filling said space and cooperatively with said collar keeping said space free of metal particles from the piercing of said fin; and,



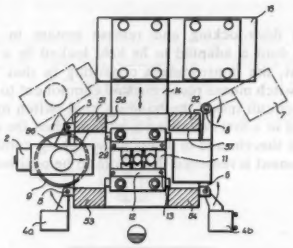
spring means engaged with said frame and said stripper bushing being operable to force said fin from said straightening bushing as said punch is withdrawn from said hole.

3,995,470

METAL-FORMING SYSTEMS

Ivan Kamelander, Brno, Czechoslovakia, assignor to Vyzkumny ustav tvarecich streju a technologie tvareni, Brno, Czechoslovakia

Filed Apr. 29, 1975, Ser. No. 572,940
Int. Cl.² B21J 9/18
U.S. Cl. 72—405 8 Claims



1. In a metal-forming system, a central press having a main drive shaft for performing operations on workpieces, first, second and third auxiliary handling means for selective types of feeding for introducing workpieces to, discharging workpieces from, and transferring workpieces within the central press, means pivotally connecting the first, second and third handling means to the press for movement toward and away from operative positions adjacent the press, and means coupled to the main drive shaft for individually operating the first, second and third handling means.

3,995,471

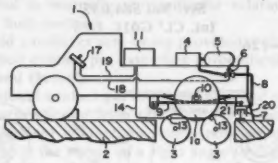
DEVICE FOR CALIBRATING A CHASSIS DYNAMOMETER

Toshiaki Konomi, Susono, and Tsunehiko Machida, Kawasaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Kabushiki Kaisha Ono Sokki Seiksakusho, Tokyo, both of, Japan

Filed Apr. 21, 1975, Ser. No. 569,936
Claims priority, application Japan, Dec. 9, 1974, 49-141396
Int. Cl.² G01L 25/00
U.S. Cl. 73—1 R 8 Claims

1. A device for calibrating a chassis dynamometer comprising a drive source including a frame and at least one drive wheel which is supported by said frame through an axle and

suspension spring means and pressed against rollers of the chassis dynamometer, a fluid pressure-operated jack means which selectively engages said axle and is adapted to lift up said axle in a direction so as to disengage said drive wheel from said rollers, a stay which supports said frame in a manner so as to bear a substantial part of the weight of said frame, said drive wheel also bearing a substantial part of the weight of said frame through said axle and said spring means, a pick-up



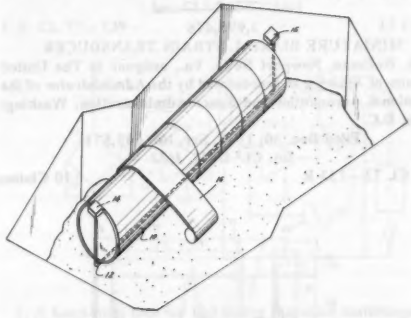
means which detects pulses generated in proportion to the rotation of said rollers, a digital computer including a digital counter and a trigger signal adjustor operatively connected with said pick-up means for processing the pulses detected by said pick-up means to compute the driving speed of the chassis dynamometer and the power absorption by the chassis dynamometer and a control panel for controlling said jack means and said computer.

3,995,472

DETECTOR SYSTEM

James T. Murray, Brooklyn, N.Y., assignor to Murgor Electric Company, Inc., Brooklyn, N.Y.

Filed June 26, 1975, Ser. No. 590,487
Int. Cl.² F17D *3/04*
U.S. Cl. 73—40 **1 Claim**



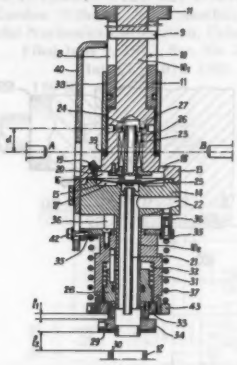
1. A detector system for monitoring material such as liquids, vapors and gas comprising a tank containing said material, a first hose in operative association with said tank, said hose being sensitive to said material whereby contact therewith renders the interior of said hose open to atmosphere, an alarm system, a pressurized second hose of said alarm system in normally operating condition, an alarm responsive to depressurization of said second hose, said first hose being in operative association with said second hose whereby exposure of the interior of said first hose to atmosphere results in the depressurization of said second hose and activation of said alarm.

3,995,473

INSPECTION HEAD

Guy Flamand, Champforgeuil, and Alain Billoud, Chalon-sur-Saone, both of France, assignors to Carnaud Total Interplastic, Chalon-sur-Saone, France

Filed July 11, 1975, Ser. No. 595,124
Claims priority, application France, July 15, 1974, 74.24742
Int. Cl.² G01M *3/26*
U.S. Cl. 73—49.2 **8 Claims**



1. An inspection head for verifying absence of leakage and resistance to crushing of a hollow object which comprises:

a fixed frame having a vertically slidable tubular column mounted thereon, the column being provided with a first diametral passage,

means for supporting a hollow object below and on the longitudinal axis of the column,

a sealing component fixed to the lower end of the column capable of sealingly engaging a mouth of the object around an aperture in the object,

elastic means between the column and the sealing component arranged to urge the sealing component towards the mouth when the column descends towards and makes contact with the object, to maintain the sealing component in contact with the mouth after contact therewith, and to exert a crushing force of predetermined magnitude on the object, when the column continues to descend after contact,

a deformable diaphragm, fixed in the tubular column in a plane transverse to the direction of sliding of the column, means for subjecting the upper face of the diaphragm to a predetermined first fluid pressure, means for subjecting the lower face of the diaphragm and also the interior of the object to a predetermined second fluid pressure exceeding said predetermined first pressure,

a vertical rod supported by and projecting upwardly from the diaphragm and traversed by a second diametral passage positioned to become aligned with the first passage when said predetermined second pressure is applied,

a tubular slider mounted to slide vertically on said fixed frame and provided with a third diametral passage aligned with the first diametral passage in a normal operative position of the tubular slider, and

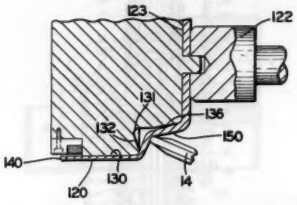
an entraining element movable with said elastic means and capable of lowering the slider and hence bringing the third passage out of alignment with the first and second passages if the object collapses after contact between its mouth and the sealing component.

3,995,474

METHOD OF MAKING SPUN V-GROOVED SHEET METAL PULLEYS

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Incorporated, Canton, Ohio

Filed July 7, 1975, Ser. No. 593,653
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.² B21D 22/14, 29/02
U.S. Cl. 72—83 20 Claims



1. In a method of making a dynamically balanced cup-shaped sheet metal pulley blank of the type having a bottom hub flange wall and a connected variable thickness side wall terminating in a radially extending annular flange from a flat sheet metal disc with pressure roll forming means, for use as a stage blank for forming a V-grooved pulley, including the steps of:

a. providing a flat uniform thickness sheet metal disc having a central hold formed therein;

b. clamping a central portion of the disc around the hole betwen opposed relatively axially movable complementary clamping faces of rotatable headstock and tailstock die means wherein the headstock die means also has stage blank side wall forming means and annular radially outwardly extending flange forming means connected with the side wall forming means;

c. rotating the die means and clamped disc;

d. reforming the disc into a cup-shaped blank having a flat hub flange bottom wall and a generally axially extending variable thickness side wall terminating in a radially outwardly extending annular flange by pressure rolling, forming and ironing rotating annular disc metal portions surrounding said central portion against the side wall forming means and annular radially extending flange forming means of the headstock die means;

e. said reforming step including thinning and elongating a portion of the disc metal along the side wall forming means of the headstock die means during the step of forming the variable thickness side wall;

f. maintaining the thickness of the disc metal in the hub flange bottom wall substantially unchanged from that of the sheet metal disc during reforming of the disc into a cup-shaped blank to provide a cup-shaped blank having a substantially uniform thickness flat bottom hub flange wall connected by a thinned and elongated variable thickness generally axially extending side wall to a radially extending annular flange; and

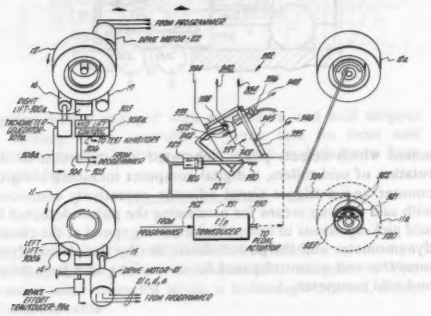
g. then while continuing rotation of the die means and clamped blank, trimming the extended end of the radially extending annular flange to a predetermined radial length with respect to the side wall.

3,995,475

COMPUTER TYPE BRAKE ANALYZER WITH AUTOMATICALLY CONTROLLED BRAKE ACTUATOR

Edwin Lee Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Division of Ser. No. 382,538, July 25, 1973, Pat. No. 3,899,916, which is a continuation-in-part of Ser. No. 811,168, March 27, 1969, abandoned. This application June 5, 1975, Ser. No. 584,035
Int. Cl.² G01L 5/28
U.S. Cl. 73—126 16 Claims



1. In an apparatus for analyzing the braking performance of a wheeled vehicle having wheel brakes individually associated with at least two wheels and a brake actuator for simultaneously applying the wheel brakes, the combination which comprises:

test means for rotating said wheels;

brake effort signal generating means for producing a separate brake effort signal for each wheel brake while the brakes are applied, each brake effort signal being representative of the braking effort of the respective wheel; and

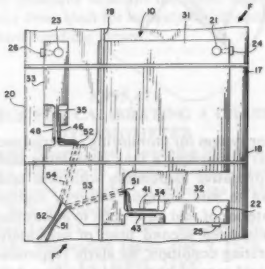
brake actuator control means for applying the brake actuator until at least one brake effort signal reaches a predetermined value.

3,995,476

MINIATURE BIAXIAL STRAIN TRANSDUCER

Ira S. Hoffman, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1975, Ser. No. 645,571
Int. Cl.² G01L 1/22
U.S. Cl. 73—133 R 10 Claims



1. Apparatus for measurement of surface strain on a test specimen in two directions comprising in combination:

a. a test specimen having a surface adapted for strain testing,

b. a strain transducer assembly for measurement of surface strain on said test specimen when said test specimen is subjected to controlled tensile and compression forces, and

c. means for maintaining said strain transducer fixed relative to the test surface of said test specimen,

said transducer assembly including

a main body portion and two cantilever arms integrally secured in mutually perpendicular relationship to said main body portion,

each said cantilever arm being provided with an integrally attached contact pin extending perpendicularly from the free end thereof,

an additional contact pin integrally attached to and extending perpendicular from said main body portion,

said additional contact pin being positioned so as to be located at the vertex of a right angle formed by the positioning of the contact pins,

each of said cantilever arms being provided with reduced diameter portions in an area thereof adjacent said main body portion,

strain sensing means secured to the reduced diameter portion of each said cantilever arm and in electrical connection with an electrical circuit for measuring the strain sensed thereby when said test specimen is subjected to tensile and compression forces,

whereby when said test specimen is subjected to a tensile or compression force said cantilever arms and the integrally attached contact points thereof will move with the surface of said test specimen relative to the contact pin attached to said main body portion of said transducer such that said cantilever arms flex in the reduced diameter portions thereof with this flexing being measured by said strain sensing means as a function of the strain being applied to said test specimen.

3,995,477
TORQUE SPANNERS

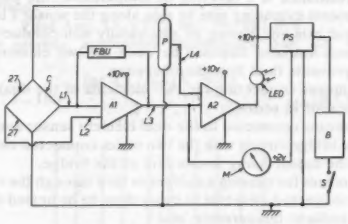
Barry Almond, Leicester, England, assignor to Black & Decker Limited, England

Filed Feb. 26, 1975, Ser. No. 553,156

Claims priority, application United Kingdom, Feb. 26, 1974, 8703/74

Int. Cl.² B25B *23/14*

U.S. Cl. 73—139 **13 Claims**



1. A hand-held tool for tightening threaded fastenings, the tool comprising a housing, a bar mounted in said housing for limited movement relative thereto, a strain gauge mounted on said bar to measure bending moment in said bar and so provide an electrical output voltage dependent on the torque applied, an amplifier circuit mounted in said housing, and an indicating device mounted in said housing, said strain gauge forming part of a bridge circuit whose output feeds into said amplifier circuit, wherein said amplifier circuit comprises a first integrated circuit amplifier and a second integrated circuit amplifier, said first integrated circuit amplifier being arranged to amplify said output of said bridge circuit and having an output fed into said second integrated circuit amplifier, and said second integrated circuit amplifier being arranged to compare said output of said first integrated circuit amplifier against a preset trip voltage so that the output of said second integrated circuit amplifier will actuate said indicating device as soon as said output of said first integrated circuit amplifier is marginally greater than said preset trip voltage, thereby to indicate to the operator that the torque has reached a prescribed value.

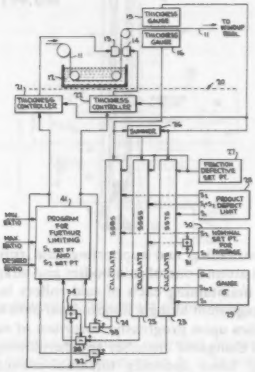
3,995,478
PLURAL INTERRELATED SET POINT CONTROLLER

Robert Gordon Wilhelm, Jr., Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed June 9, 1972, Ser. No. 261,442

Int. Cl.² G01B *3/00*

U.S. Cl. 73—150 R **22 Claims**



6. Apparatus for controlling set points for parameters related to the thickness of first and second coatings on opposite sides of a sheet in response to measurements of a property indicative of the thickness of each coating comprising means responsive to the measurements for deriving first and second indications of the spread of values of the measurements for each coating and a third indication of the spread of values of both coatings, means responsive to the first indication for deriving a first limit value for the first coating thickness, means responsive to the second indication for deriving a second limit value for the second coating thickness parameter, and means responsive to the first and second limit values and the third indication for deriving the set points.

3,995,479
APPARATUS FOR PROTECTING DOWNHOLE INSTRUMENTS FROM TORSIONAL AND LATERAL MOVEMENTS

Joseph E. Chapman, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,081

Int. Cl.² E21B *47/00*

U.S. Cl. 73—151 **13 Claims**

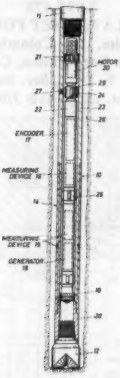
1. Well bore instrumentation apparatus adapted for suspension in a well bore and comprising:

an elongated outer tool body having a longitudinally-aligned, elongated instrumentation chamber therein with one end of said outer body being arranged for providing direct access into said elongated chamber;

an elongated inner tool body having instrumentation means thereon and adapted for insertion into said one end of said outer body and longitudinal movement within said elongated chamber to a selected fixed position therein; and

shock-isolating means adapted for cooperatively supporting

said inner body in its said fixed position within said elongated chamber and yieldably isolating said instrumentation means from shock forces imposed on said outer body, said shock-isolating means including a plurality of rollers with at least the rims of said rollers being respectively formed of a resilient material and cooperatively sized for being compressed upon insertion of said inner body into said elongated chamber and means cooperatively journalling and supporting said rollers at spaced intervals around one of said bodies and adapted for bringing and maintaining each of said rollers in rolling yieldable engagement along a longitudinal path on the other of said bodies upon progressive insertion of said inner body into said elongated chamber and developing a restraining frictional force opposing torsional movements of said inner body induced by said shock forces when said inner body reaches its said fixed position.

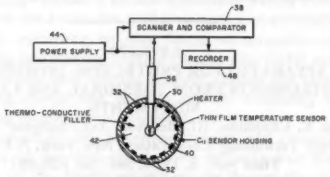


3,995,480

THERMAL SENSOR FOR MEASUREMENT OF OCEAN CURRENT DIRECTION

Gene A. Edgerton, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1975, Ser. No. 603,219
Int. Cl.² G01P *13/00*; G01W *1/00*
U.S. Cl. 73—188 **9 Claims**



1. A thermal current sensor for the measurement of ocean currents, comprising:

a. a hollow housing of non-corroding material having good heat transfer and low fouling rate characteristics, at least the exterior wall of said housing having an anti-fouling material thereon and having a circular cross-section;

b. a multitude of closely spaced thin-film temperature sensing elements formed on and lining the surface of the inside wall of said housing, said sensing elements comprising an even number of elements, each pair of elements 180° opposed to each other forming a sensing unit;

c. scanner and comparator means, said scanner and comparator means sampling the temperature of said pairs of elements 180° apart about the inside wall of said housing;

d. a heater provided at the center of said housing for uniform heat transfer throughout said housing;

e. the space between said heater and said elements lining the inside wall of said housing being entirely filled with a heat conducting medium;

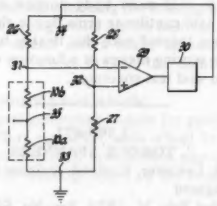
f. each of said temperature sensing elements being electrically connected to said scanner and comparator means for measuring the temperature of each of said sensing elements about the interior of said housing and for comparing temperature variations to thereby measure the stagnation points in a boundary layer of fluid flowing about said housing, said multitude of elements connected to said scanner and comparator being operable to detect the temperature gradient around said housing caused by both laminar-to-turbulent flow and velocity gradient of fluid flowing thereabout and thus determine the direction and speed of ocean current flow.

3,995,481

DIRECTIONAL FLUID FLOW TRANSDUCER

Robert S. Djorup, Wellesley, Mass., assignor to Environmental Instruments, Inc., Natick, Mass.

Division of Ser. No. 330,400, Feb. 7, 1973, Pat. No. 3,900,819. This application Aug. 11, 1975, Ser. No. 603,259
Int. Cl.² G01F *1/38*
U.S. Cl. 73—189 **2 Claims**



1. Apparatus for measuring fluid flow comprising

a. a dual element sensor having a pair of closely spaced, elongate, temperature sensitive elements whose electrical resistance is a function of temperature, the pair of elements extending side by side along the sensor's longitudinal axis and having an electrically non-conductive thermal insulator disposed between the two elements which prevents fluid flow therebetween,

b. means connecting the two elements of the dual element sensor in series,

c. means connected to the dual element sensor and forming a bridge circuit with the two series connected elements of the sensor being in one arm of the bridge,

d. means for causing a current to flow through the two series connected elements to cause them to be heated above the ambient temperature, and

e. regulating means connected to the bridge circuit for regulating the current to cause the total resistance of the series connected elements to be held constant for constant ambient temperature.

3,995,482

VORTEX SWIRL FLOWMETER SENSOR CIRCUIT

William R. Kissel, Taylor, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

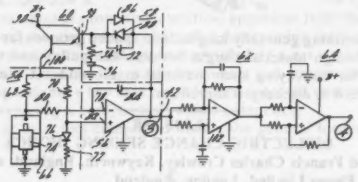
Continuation of Ser. No. 346,513, March 30, 1973, abandoned. This application May 14, 1974, Ser. No. 469,933
Int. Cl.² G01F *1/32*
U.S. Cl. 73—194 B **9 Claims**

1. In a motor vehicle having a vortex swirl flowmeter utiliz-

ing a thermal-electric sensor in the measuring probe for measuring the rate of air flow into the engine system, a sensor circuit for generating an electrical signal in response to the rate of heat loss of the thermal-electric sensor comprising:

a bridge type circuit having a balancing resistor and the thermal-electric sensor in one leg thereof and a pair of fixed resistors in the other leg, the resistance ratios in said legs being substantially equal at a predetermined temperature.

an operational amplifier having a first input electrically connected to the junction between the sensor and said balancing resistor, and a second input electrically connected to the junction between said pair of resistors,



a Darlington amplifier having its input electrically connected to a source of voltage and its output electrically connected to one of the junctions between said two legs of said bridge circuit, the other junction electrically connected to ground, and

a signal enhancement means having a pair of oppositely poled diodes and a capacitor electrically connected in parallel circuit with each other, said enhancement means electrically connected in series circuit between the output of said operational amplifier and the control input of said Darlington amplifier for increasing the current output of said Darlington amplifier maintaining said resistance ratios in response to the rate of heat loss of the thermal-electric sensor due to the air flow in the engine system.

3,995,483

METHOD FOR MAKING VISIBLE DEFECTS IN SURFACES

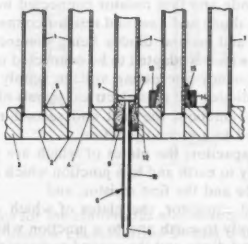
Antoon Th. A. Hartong, Delft, and Gerriet H. Douma, Bergambacht, both of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Aug. 19, 1975, Ser. No. 605,876

Claims priority, application Netherlands, Aug. 23, 1974, 7411251

Int. Cl.² G01N *19/08*

U.S. Cl. 73—104 **18 Claims**



1. A method for making visible defects in a hot surface having a temperature of above 100° C comprising:

applying to the hot surface, a penetrating liquid containing a dye that soaks in the defects;

removing excess penetrating liquid from the hot surface;

applying, as a developer, a layer of a heatcurable synthetic resin paste to the hot surface after removal of the excess penetrating liquid, said dye migrating into said layer from the defects;

curing the synthetic resin by the heat content of the hot surface into a replica of the surface in which the reversed image of the defects is recorded; and

removing the replica from the hot surface to preserve the location and nature of the defects.

3,995,484

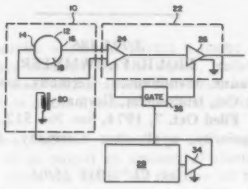
ELECTROMAGNETIC FLOWMETER CHARACTERIZED BY ZERO QUADRATURE SIGNAL

Heinz Walter Gruner, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,635

Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **5 Claims**



1. An electromagnetic flowmeter comprising:

a pipe;

a pair of measuring electrodes provided on said pipe;

an electromagnetic coil responsive to a current for establishing a field which is intersected by a fluid passing through the pipe to produce a signal voltage across the electrodes; and

current means for supplying said current; said current having a periodic waveform,

each period of which is characterized by

1. a first and a second DC level, and

2. continuous transitions between said DC levels, said transitions being monotonic half cycles of a sine wave, said half cycles interposed between said DC levels beginning and ending with zero slope

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3,995,485

DRY, PORTABLE CALORIMETER FOR NONDESTRUCTIVE MEASUREMENT OF THE ACTIVITY OF NUCLEAR FUEL

Norman S. Beyer, Elmhurst; Robert N. Lewis, Clarendon Hills, and Ronald B. Perry, Hinsdale, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

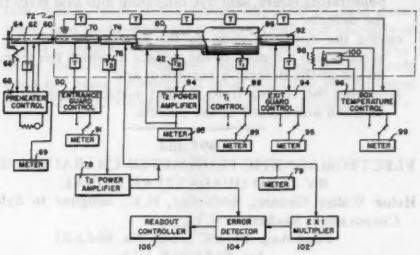
Filed Oct. 20, 1975, Ser. No. 624,194

Int. Cl.² G01K *17/00*

U.S. Cl. 73—190 R **5 Claims**

1. A method of measuring the amount of heat-producing radioactive material in a quantity of nuclear fuel having a known isotopic ratio comprising the steps of: measuring the electric power required to maintain a test chamber at a given temperature with no nuclear fuel in the chamber; inserting the quantity of nuclear fuel into the chamber; repeatedly measuring the electric power required to maintain the test chamber at the given temperature with the quantity of nuclear fuel inserted; subtracting to obtain the difference of the measured powers; calculating the mean values of readings of the electric power thus required; calculating the standard deviation of the mean value of the electric power thus required; terminating

the measuring sequence when the standard deviation of the mean value of the electric power thus required is less than a



predetermined value of standard deviation; and calculating to convert the difference of the measured powers into a measure of the amount of heat-producing radioactive material.

3,995,486

LIQUID FLOWMETER

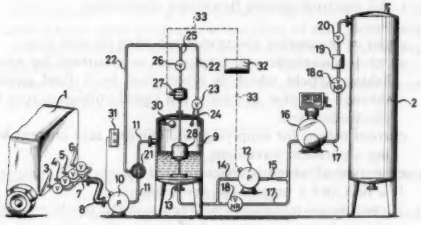
Manfred Kaune, Wendhausen, Germany, assignor to Diessel GmbH & Co., Hildesheim, Germany

Filed Oct. 7, 1974, Ser. No. 512,857

Claims priority, application Germany, Oct. 27, 1973, 2353916

Int. Cl.² G01F *15/08*

U.S. Cl. 73—200 **5 Claims**



1. An apparatus for flow metering and delivering liquids, particularly milk, from first container means to elevated second container means comprising:

a. a first centrifugal pump having an inlet and an outlet with said inlet connected to said first container means;

b. an air eliminator having a bottom, said air eliminator connected to said outlet;

c. a main line conduit connected to said bottom of the air eliminator;

d. a volume meter connected between said main line and said elevated second container means;

e. a by-pass conduit having first and second ends connected into said main line; and

f. a second centrifugal pump having a capacity less than said first centrifugal pump located in said by-pass for maintaining said liquids level in said air eliminator.

3,995,487

SELF CLEANING PULLEY FOR CONVEYOR BELTS

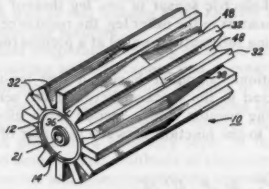
Daniel W. Locke, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Sept. 8, 1975, Ser. No. 610,994

Int. Cl.² F16H *57/04*, *55/48*

U.S. Cl. 74—230 **13 Claims**

1. In a self cleaning pulley for conveyor belts, a cylindrical member and a layer of elastomeric material on the periphery of said cylindrical member, said layer having an annular body secured to the external surface of said cylindrical member and a plurality of generally longitudinally positioned resilient and flexible ribs extending radially outwardly from said body and spaced uniformly around the periphery thereof, said spaced



ribs defining generally longitudinal spaced grooves for receiving foreign material caught between the pulley and the belt and for conveying such material to the ends of the pulley where it is discharged therefrom.

3,995,488

DIELECTRIC CHANGE SENSING DEVICE

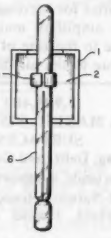
David Francis Charles Crawley, Keyworth, England, assignor to Fisons Limited, London, England

Continuation of Ser. No. 436,739, Jan. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 263,276, June 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 49,353, June 24, 1970, abandoned. This application June 10, 1975, Ser. No. 585,586

Claims priority, application United Kingdom, Nov. 16, 1971, 53030/71

Int. Cl.² G01F *23/00*

U.S. Cl. 73—304 C **9 Claims**



1. A sensing device for use in the sensing of impedance changes, which sensing device comprises a sensing head and an output circuit connected thereto, wherein the sensing head comprises a bridge circuit and a conducting screen in the form of an open-ended box within which the bridge circuit is rigidly mounted, said bridge circuit comprising:

a. a first diode and first resistor connected in series;

b. a second diode and a second resistor connected in series; the first and second diodes being connected to a first junction which is adapted to be connected to a modulated high frequency alternating voltage supply such that, in use, the diodes will pass electrical signals of opposite sign from the junction; the first and second resistors being connected to a second junction;

c. a first capacitor, the plates of which are connected respectively to earth and to a junction which is between the first diode and the first resistor; and

d. a second capacitor, the plates of which are connected respectively to earth and to a junction which is between the second diode and the second resistor; the conducting screen having an aperture therein adjacent to the first capacitor; and said output circuit comprising:

i. a direct current blocking capacitor, one plate of which is connected to said second junction, and the other plate of which provides the output from the device; and

ii. a load resistor connected between said second junction and earth; wherein, in use, a change in the dielectric

properties in a body adjacent to the first capacitor produces a change in the pulsed output signal from said output provided by said direct current blocking capacitor.

3,995,489

MALONIC ACID DERIVATIVE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

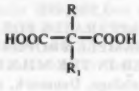
James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,219
Int. Cl.² G01K *13/02*
U.S. Cl. 73—339 R 18 Claims

1. A method of protecting electrical apparatus from damage due to overheating and for thereafter determining the location of said overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected comprising:

A. preparing a composition which comprises;

1. at least one compound having the general formula



where R is selected from the group consisting of alkyl to C_{10}, aryl, alkyl aryl to C_{10}, cycloaliphatic, and heterocyclic, and R_1 is selected from the group consisting of R and hydrogen; and

2. a solution of at least one resinous carrier curable and stable at 60° C and unreactive with said compound;

B. applying said composition to said electrical apparatus at positions exposed to said gas stream;

C. evaporating said solvent; and

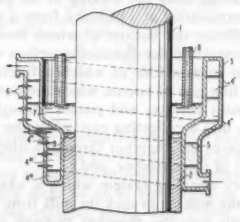
D. monitoring said gas stream for the presence of particulates therein.

3,995,490

METHOD AND APPARATUS FOR THE CONTINUOUS MONITORING OF A CONTINUOUS METALLURGICAL PROCESS

Donatello Canalini, Vitinia (Rome), and Eugenio Repetto, Rome, both of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Oct. 14, 1975, Ser. No. 662,179
Claims priority, application Italy, Oct. 11, 1974, 53487/74
Int. Cl.² B22D *11/12*; G01F *23/24*
U.S. Cl. 73—340 8 Claims



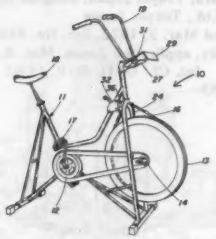
1. Apparatus for the continuous monitoring of a continuous metallurgical process characterized in that a body of molten metal continuously solidifies to increase the length in one direction of a body of solidified metal, comprising an annular cooling jacket to surround said bodies of molten metal and solidified metal, means for passing a cooling fluid through said jacket in a helical path, and means for measuring the temperature of said coolant fluid at each of a plurality of turns of the helix.

3,995,491

ERGOMETER

Lyman H. Wolfla, II, Indianapolis, Ind., assignor to Preventive Cardiopath Systems, Inc., Indianapolis, Ind.

Filed Aug. 18, 1975, Ser. No. 605,719
Int. Cl.² G01L *5/02*
U.S. Cl. 73—379 18 Claims



17. In an exercise apparatus having a frame, a rotatable flywheel member mounted on the frame, pedal means for rotating the flywheel member, and resistance means for opposing the rotation of the flywheel member, the improvement which comprises:

first means, not coupled to a source of electrical energy, for producing at an output an amount of electrical energy dependent upon the speed of rotation of the flywheel member relative to the frame;

meter means coupled to the output of the first means for providing an indication of the amount of said electrical energy; and

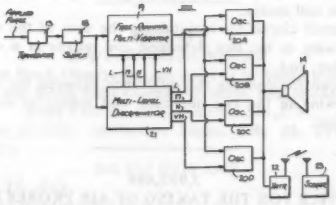
control means coupled to the frame for varying the opposition of the resistance means to the rotation of the flywheel member, the setting of the control means affecting the degree of coupling from the output of the first means to the meter means.

3,995,492

SOUND-PRODUCING ISOMETRIC EXERCISER

Manfred E. Clynes, 8571 Villa LaJolla Drive, LaJolla, Calif. 92037

Filed Aug. 11, 1975, Ser. No. 603,781
Int. Cl.² G01L *5/02*
U.S. Cl. 73—379 14 Claims



1. An isometric exerciser comprising:

A. a pair of spaced bodies which are engageable by respective extremities of a user and are joined together by a link having associated therewith a force-responsive transducer producing an electrical value depending on the pressure or tension force applied to said bodies by said user; and

B. means responsive to said electrical value to produce an audible signal whose nature depends on the strength of the applied force to advise the user regarding his performance, said bodies and transducer and said audible signal

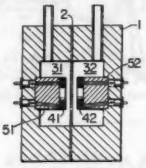
means being combined into a unitary exerciser which is movable by the user in any desired motion pattern in the course of which the signal is heard.

3,995,493

DIFFERENTIAL PRESSURE TRANSDUCER

Tadashi Nishihara, Tokyo, Japan, assignor to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Mar. 3, 1975, Ser. No. 554,491
Claims priority, application Japan, Mar. 8, 1974, 49-27454
Int. Cl.² G01L *9/10, 13/02*
U.S. Cl. 73—393 **7 Claims**



1. A differential pressure transducer comprising
a pair of support members maintained in juxtaposition with one another,
a non-magnetic, electrically conductive measuring diaphragm supported between the support members, each support member and the measuring diaphragm defining a measuring chamber on a side of the measuring diaphragm,
each support member having a cavity,
passageway means connecting the measuring chamber and cavity of each support member,
seal diaphragm means positioned over the cavity of each support member to seal the cavity,
means enabling the application of the differential pressure to be transduced to the surfaces of the seal diaphragms exterior to the cavities,
incompressible fluid occupying the measuring chambers, passageway and cavities,
detection coil means having cores of magnetic material disposed in each of the support members spaced from the passageway and positioned so as to be capable of detecting displacement of the measuring diaphragm by inducing eddy currents in the measuring diaphragm and by producing admittance changes in the coil means arising upon displacement of the measuring diaphragm,
an oscillation circuit for supplying AC signals to the detection coil means,
a control circuit for maintaining the sum of the currents flowing in the two detection coil means at a constant value, and
a circuit for deriving the difference between the currents flowing in the two detection coil means as an output signal.

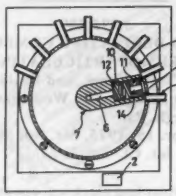
3,995,494

DEVICE FOR THE TAKING OF AIR PROBES IN A SEQUENTIAL MANNER

Karl H. Muller, Casciago, and Andre E. Sieffert, Cardana, both of Italy, assignors to European Atomic Energy Community (Euratom), Luxembourg

Filed Nov. 28, 1975, Ser. No. 635,948
Claims priority, application Luxembourg, Nov. 27, 1974, 71369
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **7 Claims**

1. Automatic sampling device for atmospheric probes which enables a sampling program to be varied within wide limits, comprising a distributor having a full-length bore and pivotably mounted in a distributor housing having apertures on a hollow spindle in such a manner that the mouth of the bore during rotation passes across at least one of said apertures whereby the hollow spindle is connected on the one side to the



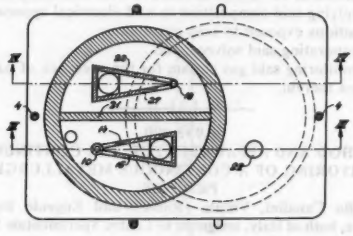
bore and on the other to the pressure side of an air pump drawing in air from its surroundings and the distributor is driven by a shaft whose rotation controls the beginning, sequence and duration of the probes taken as a function of the local distribution of apertures on the distributor housing.

3,995,495

METHOD AND AN APPARATUS FOR TAKING OUT AN AVERAGE MILK SAMPLE PROPORTIONAL TO THE YIELD OBTAINED IN THE MILKING OF A COW

Poul Erik Aegidius, Helsinge, Denmark, assignor to N.K. Verwaltungs AG, Zug, Switzerland

Filed July 31, 1975, Ser. No. 600,552
Int. Cl.² G01N *1/18*
U.S. Cl. 73—422 R **11 Claims**



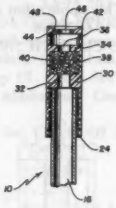
1. An apparatus for taking out an average sample of milk proportional to the yield from the milking of a cow and comprising
a. a primary sampling system with a chamber into which the milk is sucked during the milking of the cow through a first tube terminating at a distance from a superimposed circular cylinder the bottom of which forms a substantially horizontal circular distributor surface which spreads the milk to form a film of which a fraction is caught between a first pair of knives, which are not integral with the distributor surface, and passed through a normally open valve into a collecting cup, while the major part of the milk leaves the chamber through a discharge tube in the bottom of the chamber, and
b. a secondary sampling system which is adapted on completion of the milking to suck the milk from the collecting cup upwards into the chamber through a second tube extending from the bottom of the collecting cup and terminating at a distance from a superimposed second circular cylinder the bottom of which forms a second substantially horizontal circular distributor surface which spreads the milk to form a film of which a fraction is caught between a second pair of knives, which are not integral with the second distributor surface, and led down into a test cup, while the major part of the milk from the collecting cup leaves the chamber through the discharge tube in the bottom of the chamber.

3,995,496

DISPOSABLE MOUTH GUARD FOR PIPETTES

Albert G. Bickford, 2208 Humboldt Ave. South, Minneapolis, Minn. 55404

Filed Sept. 2, 1975, Ser. No. 609,349
Int. Cl.² B01L 3/02; G01N 1/14
U.S. Cl. 73—425.6 13 Claims



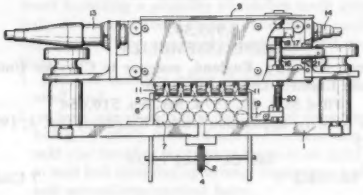
1. A one-piece disposable mouth guard for attachment to pipettes comprising a tubular sleeve having a plurality of internal flexible annular ribs near one end integral with said sleeve and extending from the inner surface of said sleeve, said sleeve having a chamber near the other end thereof, and a medium contained in said chamber for obstructing the flow of liquid therethrough.

3,995,497

APPARATUS FOR PREVENTING DEFECTIVE PACKING OF CIGARETS

Yoshio Negishi, Gyoda, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,233
Int. Cl.² B65B 63/00
U.S. Cl. 73—432 R 5 Claims



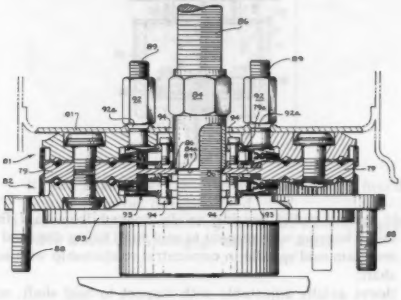
1. An apparatus for preventing defective packing of cigarets which comprises a frame provided on the upper surface of a base, a pressing means for moving a plurality of cigarets arranged on many steps so as to be packed in the lengthwise direction of the cigarets along said frame, a plurality of contact arms each fitted at the lower end with a roller corresponding to each cigaret on the uppermost step, supported independently rotatably on a shaft arranged at right angles with said frame and fitted at the upper end with a shielding means, a sensing lever which is pivoted at one end on a supporting shaft rotating against a spring on the side of the lower step of the cigarets and fitted with a shielding means near the upper end and which projects at right angles with the advancing direction of the cigarets and a pair of optical means provided to be arranged in line with each of said shielding means.

3,995,498

WHEEL MOUNTING ASSEMBLY FOR TIRE BALANCING MACHINE

Donald B. Curchod, and Wilhelm Borner, both of Santa Clara, Calif., assignors to Norton Corporation, Mountain View, Calif.

Filed May 13, 1975, Ser. No. 577,034
Int. Cl.² G01M 1/04; F16H 55/12, 55/18
U.S. Cl. 73—480 9 Claims



1. A wheel mounting assembly comprising a support plate designed and adapted to be supported for rotation while carrying a wheel and tire combination, a plurality of wheel mounting studs, means carried by said plate and associated with said studs for simultaneously moving said studs uniformly between first and second radial positions defined about the axis of rotation of said support plate, the last named means including a central gear disposed on the axis of rotation of the support plate, a plurality of satellite gears corresponding in number to the number of said studs and disposed about said axis of rotation in engagement with said central gear, a plurality of stud support means each mounting one of said studs therefrom and coupled to rotate with an associated one of said satellite gears whereby rotation of one of said stud support means rotates the others to the same degree via said central gear to move said studs from said first to said second position bearing means disposed between said plate and said stud support means, and means releasably engaging said plate for tightening said stud support means against said bearing means in varying degree to remove substantially all clearance between said stud support means and said bearing means and between said plate and said bearing means consistent with permitting the gears to be rotated while so disposed.

3,995,499

EDDY-CURRENT METER

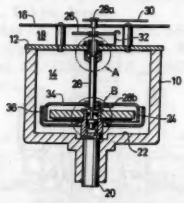
Hirokazu Horii, Ohmiya, Japan, assignor to Nissan Motor Co., Ltd. and Kanto Seiki Company Limited, both of Japan

Filed Feb. 20, 1975, Ser. No. 551,277
Claims priority, application Japan, Feb. 26, 1974, 49-22859[U]
Int. Cl.² G01P 3/49
U.S. Cl. 73—519 5 Claims

1. In an eddy-current meter:
a shaft whose rotation speed is to be measured;
a support bearing coaxial with said shaft;
a permanent magnet fixed for rotation with said shaft;
a spindle carrying a pointer, said spindle having a journal formed at one end, a reduced diameter portion at an opposite end and a shoulder formed intermediate said one end and the opposite end;
said spindle being mounted rotatable on said support bearing with said journal;
a first radial bearing fixed to said shaft to radially support said spindle at a portion adjacent said journal;

a metal cup close to said permanent magnet and attached to said spindle;

a second radial bearing axially spaced from said first radial bearing radially supporting said reduced diameter portion of said spindle, said second radial bearing having a reduced diameter end rotatably abutting against said shoulder of said spindle;



said second radial bearing axially spaced from said first radial bearing with respect to said shaft being disposed to maintain said spindle in concentric relationship with said shaft;

a sleeve axially adjustable with respect to said shaft, said sleeve carrying said second radial bearing; and

a spring biasing said support bearing of said shaft and said journal of said spindle axially and yieldably toward each other.

3,995,500

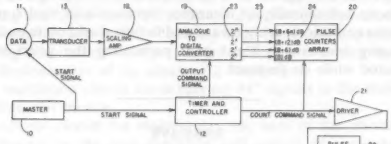
LOGARITHMIC STATISTICAL DISTRIBUTION ANALYZER

Paul D. Schomer, Champaign, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1975, Ser. No. 637,793

Int. Cl.² G01H 3/14

U.S. Cl. 73—552 **7 Claims**



1. Apparatus for measuring the logarithmic distribution of a given physical quantity comprising:

a. transducer means for detecting the level of a physical quantity and coverting said physical quantity into a corresponding analog signal;

b. converter means connected to said transducer means for changing said analog signal into an equivalent digital signal having discrete output levels corresponding to power of two;

c. pulsing means connected to said converter means for pulsing said digital signal; and

d. counting means for receiving said digital signal and counting each discrete output level of said digital signal whereby the time during a finite period that said physical quantity is above a given discrete level can be found from the ratio of the number of pulses at said given discrete level and the total number of pulses during said finite period.

3,995,501

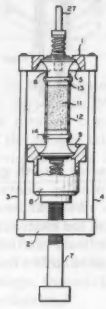
SHEAR AND COMPRESSION WAVE TESTING AND MEASURING DEVICE

Bruce F. Wiley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 518,854, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 322,260, Jan. 9, 1973, abandoned, which is a division of Ser. No. 28,368, April 14, 1970, abandoned. This application Aug. 7, 1975, Ser. No. 602,868

Int. Cl.² G01H 5/00

U.S. Cl. 73—560 **15 Claims**



1. A transducer sonic velocity testing or measuring apparatus adapted to measure the respective velocities of rotational shear and compressional waves passed through a sample which comprises contact pieces for holding a sample such as a formation core therebetween, a rotational shear transmitter, and a compressional transmitter for transmitting, respectively, a rotational shear and a compressional wave through said sample, a rotational shear receiver and compressional wave receiver, respectively, for receiving a rotational shear and a compressional wave transmitted through said core, the apparatus being characterized in that at least one of the rotational shear transducers is positioned between a compressional transducer and the contact piece at an end of said core, and an oil decoupling film between one of the shear and one of the compressional transducers at said end.

3,995,502

SLIDE ASSEMBLIES

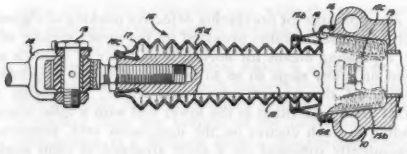
Clive Jones, Coventry, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Sept. 30, 1974, Ser. No. 510,654

Claims priority, application United Kingdom, Oct. 4, 1973, 46441/73

Int. Cl.² F16J 15/50

U.S. Cl. 74—18.2 **7 Claims**



1. A slide assembly comprising a housing having a bore provided with an open end, a member slidably supported in said bore in the housing so as to selectively project to a variable extent from the open end of the bore in the housing and a flexible tubular bellows having opposing ends, one end of which is secured to the housing at the open end of the bore

and the other end of which is secured to the member remote from the housing, the bore at its open end at the housing being constructed to receive therein the flexible bellows in its contracted condition when the member is moved into a retracted position within the bore in the housing.

3,995,503

MULTIPLE-SPEED HUB

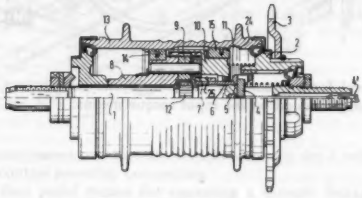
Horst Schulz, Friedrichshafen, Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed May 15, 1975, Ser. No. 577,753

Claims priority, application Germany, May 29, 1974, 2426133

Int. Cl.² F16H *3/44*

U.S. Cl. 74—750 B **8 Claims**



1. A multiple-speed hub comprising:

a. a hub shell having a central axis and mounted for rotation about said axis;

b. a driver mounted in said shell for rotation about said axis;

c. planetary gearing including a sun gear, a ring gear member, and a planet carrier member mounted in said hub shell for rotation of said members relative to said sun gear and said hub shell, and at least one planet gear rotatably mounted on said planet carrier member and simultaneously meshing with said sun gear and said ring gear member;

d. first coupling means for alternatively coupling said members to said driver for joint rotation; and

e. second coupling means including cooperating elements respectively mounted on one of said members and on said hub shell, one of said cooperating elements including a pawl having a first engagement face, and the other element including a plurality of ratchet teeth circumferentially distributed about said axis and having each a second engagement face engageable with said first engagement face,

1. said one member being axially movable in said hub shell, and

2. at least one of said first and second engagement faces being obliquely inclined relative to said axis, whereby said one member is urged to move in an axial direction in said hub shell during driving engagement of said first and second engagement faces.

3,995,504

SELECTIVELY BI-DIRECTIONAL TAPE FEED MECHANISM

Richard J. LaManna, Whippany, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,501

Int. Cl.² F16H *27/02*

U.S. Cl. 74—143 **12 Claims**

1. A mechanism for producing step motion in either direction comprising:

a rotatable output shaft having an axis of rotation;

a drive wheel secured to the shaft;

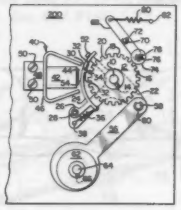
a rotatable rocker plate having an axis of rotation in an alignment with the axis of rotation of the shaft;

means to continuously oscillate the plate between a first limit and a second limit;

the means to oscillate the plate imparting a periodic velocity profile to the plate;

a pawl mounted on the plate engagable with the wheel when the plate is at a velocity close to and including zero velocity and adapted to drive the wheel in either a first direction or a second direction; and

a control means to selectively cause the pawl to engage the drive wheel and disengage the drive wheel.



3,995,505

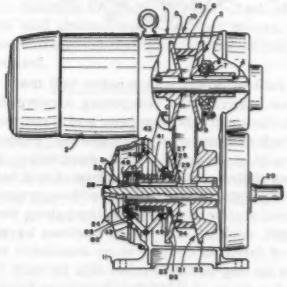
MEANS FOR AND METHOD OF VARIABLE DRIVE SPRING COMPENSATION

Frederick O. Luenberger, Stratford, Conn., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 23, 1975, Ser. No. 589,040

Int. Cl.² F16H *55/52*, *55/56*

U.S. Cl. 74—230.17 A **7 Claims**

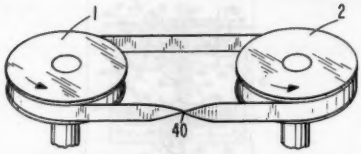


1. In a variable speed drive having a drive pulley and a driven pulley, both of said pulleys having at least one movable disc and the driven one having a movable disc mounted on a shaft and axially biased continuously toward another facing disc by a compression spring mounted on and around said shaft, the improvement comprising means for caging the ends of said spring, said caging means comprising annular cups, one at either end of said spring, and centrifugally actuated means operatively connected to said caging means for counteracting a part of the axial bias of said spring when said shaft and disc are rotated, said centrifugally actuated means comprising elongate two-ended bendable members connected at opposite ends to said cups, whereby the axially biased spring force is reduced with increasing speed of rotation, without affecting the speed of rotation of said driven pulley with respect to said drive pulley.

3,995,506
POWER TRANSMISSION BELT

Norman Poe, 6260 Magnolia St., Philadelphia, Pa. 19144

Filed June 26, 1975, Ser. No. 590,482
Int. Cl.² F16G 1/26, 1/28
U.S. Cl. 74—231 MB 6 Claims

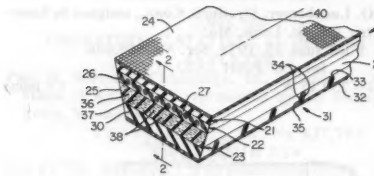


1. A power transmission belt having an odd number of half-twists consisting of a laminated structure assembled from a unitary strip of flexible material having an adhesive surface on one side thereof for holding together said laminae and a friction surface on a second side thereof for transmitting mechanical power.

3,995,507
ENDLESS POWER TRANSMISSION BELT AND METHOD OF MAKING SAME

Jack D. White, and James R. Thomas, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Sept. 15, 1975, Ser. No. 613,655
Int. Cl.² F16G 5/16; B29H 7/22
U.S. Cl. 74—233 20 Claims



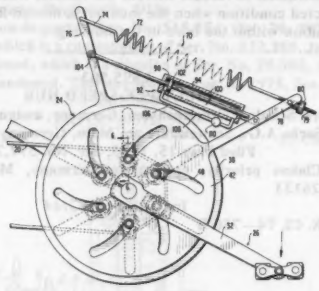
1. An endless power transmission belt made primarily of elastomeric material and comprising a compression section having an elastomeric bottom layer and means for stress-relief of said belt during operation thereof around associated sheaves, said stress-relief means comprising, a continuous fabric layer defining the inside surface of said belt, said fabric layer having a plurality of folded portions extending into said compression section at spaced positions along the endless path of said belt, each of said folded portions having associated portions of fabric in contact at an associated interface, said interfaces serving as stress-relief slits for said belt, and said associated portions of said fabric serving as fabric cushions on opposite sides of an associated stress-relief slit.

3,995,508
AUTOMATIC BICYCLE TRANSMISSION

Harold R. Newell, S. Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Filed Mar. 31, 1975, Ser. No. 563,335
Int. Cl.² F16H 55/30, 55/54
U.S. Cl. 74—244 20 Claims

1. In combination with a variable drive ratio transmission having a drive wheel, a flexible drive chain, chain engaging means mounted on the drive wheel for transmitting force between the drive wheel and the drive chain and cyclically variable input torque means for imparting rotation to the drive wheel, the improvement including torque responsive control means connecting the drive wheel to the input torque means for biasing the chain engaging means to a drive ratio limit position, and force modifying means connected to the drive

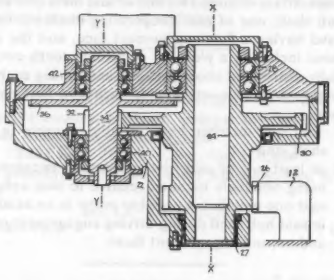


wheel for substantially reducing cyclic fluctuations in drive ratio produced by the input torque means.

3,995,509
ROTATING HINGE PIN FOR SPRING LOADED GEAR BOX

Lester Frank Backus, Charlotte, and Donald Henry Spawn, S. Burlington, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Nov. 7, 1975, Ser. No. 629,747
Int. Cl.² F16H 1/06, 1/20; F41G 5/00
U.S. Cl. 74—413 3 Claims



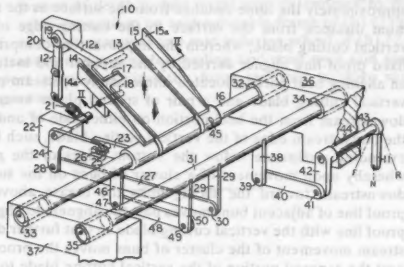
1. A turret assembly comprising:
a rotatable turret;
a stationary bull ring;
a drive assembly including
a housing;
a hinge pin journaled to and between said housing and said turret;
a drive gear journaled to said housing and meshed with said bull ring;
first drive means coupled to said drive gear for rotating said drive gear and thereby said turret with respect to said bull ring; and
second drive means coupled to said hinge pin for rotating said hinge pin with respect to said housing and said turret.

3,995,510

CONTROL SYSTEM FOR A HYDROSTATIC TRANSMISSION

John P. Yost, Willoughby, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 5, 1975, Ser. No. 574,802
Int. Cl.² G05G 13/02
U.S. Cl. 74—478.5 8 Claims



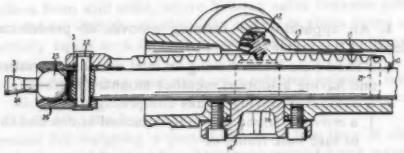
1. A transmission and throttle control assembly for a vehicle, said control assembly comprising:
a first foot pedal means for operating a throttle linkage when moved in a forward direction;
a second foot pedal means for operating a transmission control linkage in a forward direction when said second foot pedal means is moved in a forward direction;
a thrid foot pedal means for operating said transmission control linkage in a reverse direction when said third foot pedal means is moved in a forward direction; and
said first foot pedal means, said second foot pedal means and said third foot pedal means being mounted in a common plane, pivotal about a common axis and closely juxtaposed so that said first foot pedal means and any one of said second and third foot pedal means may be depressed simultaneously by a single foot of an operator.

3,995,511

RACK AND PINION STEERING GEAR AUTOMOTIVE VEHICLES

Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia

Filed June 16, 1975, Ser. No. 587,286
Claims priority, application Australia, June 21, 1974, 7941/74
Int. Cl.² B62D 1/20; F16H 1/04
U.S. Cl. 74—498 11 Claims



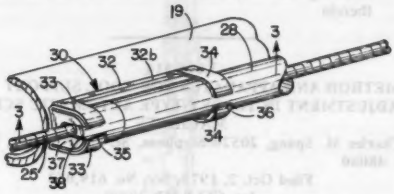
1. A rack and pinion steering gear having a cross-rod reciprocal along its longitudinal axis and a rack cooperating with the pinion, wherein the rack is formed as a member separate from and mounted directly on and connected to the cross-rod, said rack being positioned between said cross-rod and said pinion and being supported by said cross-rod against forces exerted by said pinion against said rack tending to move said rack toward the axis of the cross rod.

3,995,512

SHEATH ANCHOR FOR CABLE CONTROL SYSTEMS

Howard H. Johnsen, Dallas, Tex., assignor to National Independent Distributor Associates, Inc., Minneapolis, Minn.

Continuation of Ser. No. 411,804, Nov. 1, 1973, abandoned.
This application June 11, 1975, Ser. No. 585,784
Int. Cl.² F16C 1/10
U.S. Cl. 74—501 R 4 Claims



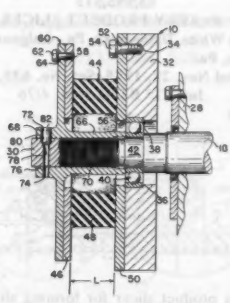
1. A sheath anchor for anchoring one end of the longitudinal sheath of a sheathed cable control system for bicycles, said sheath anchor comprising:
a. a base having opposed ends;
b. retainer means on said base for the reception of the cable sheath adjacent each end of said base to limit movement of the sheath transversely of the longitudinal dimensions thereof;
c. abutment means on said base, said abutment means being axially engageable by one end of the sheath for limiting movement of the sheath in one direction longitudinally thereof;
d. said abutment means having a slot formed therein for transversely receiving a cable;
e. said retainer means having slots formed therein for transversely receiving a cable;
f. one of said slots in said retainer means being skewed with respect to the longitudinal dimension of the cable; and
g. said one retainer means slot permitting the transverse passage of a cable therefrom only when the sheath is moved in a direction longitudinally thereof out of engagement with said abutment and retainer means, and the cable is skewed correspondingly with said one slot in said retainer means.

3,995,513

DRIVE LINE VIBRATION ABSORBER

John K. Amdall, and William O. Jankovsky, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1975, Ser. No. 555,004
Int. Cl.² F16F 15/10
U.S. Cl. 74—574 11 Claims



1. A drive line vibration absorber, for a mass elastic system having a relatively low natural frequency including an engine

operatively connected to a transmission through an elongated drive shaft, comprising;

an inertia mass radially supported for relatively free rotation on such drive shaft; and

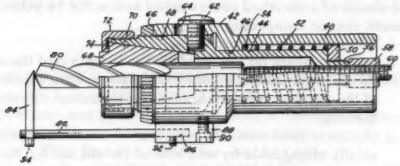
elastomeric ring means secured in axially driving cooperation intermediate said drive shaft and said inertia mass for permitting a relatively soft torsional movement thereof in tuned relation to the mass elastic system and effectively reducing the amplitude of torsional vibration levels therein.

3,995,514

METHOD AND APPARATUS FOR TOOL SUPPORT AND ADJUSTMENT IN TURRET-TYPE AUTOMATIC SCREW MACHINES

Charles M. Spang, 20520 Stephens, St. Clair Shores, Mich. 48080

Filed Oct. 2, 1975, Ser. No. 619,053
Int. Cl.² B23B *29/00*
U.S. Cl. 82—36 R **7 Claims**



1. In combination, in an automatic, turret-type screw machine having a turret tool support provided with tool supporting ways,

a. a bracket mount on each way having a split sleeve to receive a tool support barrel,

b. a tool mount for each bracket mount having a barrel portion to be received in the split sleeve of the bracket mount and having a recess for receiving a tool sleeve, said recess having a rearwardly facing shoulder,

c. means for clamping the barrel portion in the bracket mount,

d. a tool sleeve slidably mounted within each tool mount having a shoulder on the inner end,

e. spring means abutting at each end against said shoulders for urging each said sleeve in an axial tool retractive direction, and

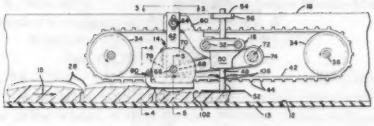
f. means movably mounted on said tool sleeve to move said tool sleeve to a desired axial position within said tool mount and to retain said tool sleeve in said desired position.

3,995,515

BAKERY PRODUCT SLICER

David Laverne White, Dallastown, Pa., assignor to Alto Corporation, York, Pa.

Filed Nov. 28, 1975, Ser. No. 635,891
Int. Cl.² B26D *3/08, 4/76*
U.S. Cl. 83—4 **12 Claims**



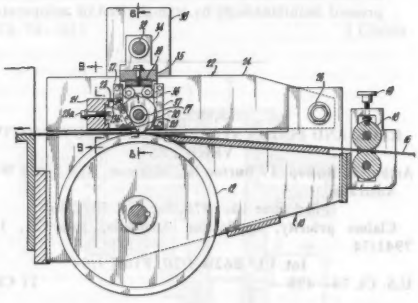
1. A bakery product slicer for forming slits in clusters of buns or the like as they are moved on a surface downstream past the slicer; the slicer including a support above the surface; a horizontal slicing unit on the support having a vertical rotary shaft journaled in and held by the support and a horizontal rotary cutting blade at the lower end of the shaft; and a vertical slicing unit on the support located upstream from the horizontal slicing unit and including a horizontal rotary shaft journaled in and held by the support upstream of the vertical rotary shaft and a vertical rotary cutting blade on the horizontal rotary shaft located directly upstream of the vertical rotary shaft; and drive means for rotating the shafts and blades; the cutting edge of the horizontal cutting blade being located approximately the same distance from the surface as the minimum distance from the surface to the cutting edge of the vertical cutting blade; wherein the improvement comprises a fixed proof-line aligner carried by the support and including an aligning heel portion located immediately upstream of the vertical cutting blade and a pair of spaced plates extending downstream from the heel portion on either side of and past the downstream edge of the vertical cutting blade, such blade extending a distance below the bottom edges of the plates whereby upon movement of a cluster of buns on the surface downstream toward the slicing units the crease above the proof line of adjacent buns moves past the aligners to align the proof line with the vertical cutting blade so that further downstream movement of the cluster of buns moves the proof line past the exposed portion of the vertical cutting blade to form a vertical slit at the Proof line, the vertical rotary shaft following in such slit as the horizontal cutting blade forms horizontal slits in the buns.

3,995,516

APPARATUS FOR SKIVING GROOVES IN FLAT METAL STRIP

Norman E. Boily, Pawtucket, R.I., and Richard N. Jowitt, Warren, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Aug. 18, 1975, Ser. No. 605,394
Int. Cl.² B23D *1/00*
U.S. Cl. 83—5 **1 Claim**



1. An apparatus for forming grooves of predetermined depth in flat metal strip comprising:

a. a fixed base frame having an inlet end and an outlet end and having a support member mounted thereon;

b. a cantilever skiving means comprising,

1. a movable frame pivotably attached at one end thereof to said base frame of

a. and positioned above said base frame,

2. an indexing wheel vertically adjustably mounted on said moveable frame of (b) (1) for contacting said flat metal strip while said strip is passed between said indexing wheel and the support member of (a), said indexing wheel being mounted for rotation in an index support bracket comprising a support beam mounting idler wheels for contacting said indexing wheel and directing force exerted on said indexing wheel to said support beam, said index support bracket being verti-

cally slideably mounted to said moveable frame of (b) (1) and attached to an index adjusting shaft through a Scotch yoke, said index adjusting shaft being rotatably mounted on said moveable frame of (b) (1) for vertical movement of said index support bracket acting through said Scotch yoke, whereby the position of said indexing wheel relative to said moveable frame may be adjusted;

3. cutting means horizontally adjustably mounted on said moveable frame of (b) (1) and positioned to skive a groove of depth in said metal strip determined by the relative positions on said moveable frame of (b) (1) of said cutting means and said indexing wheel of (b) (2);

c. transporting means for feeding said strip over said support member against the force required to skive said groove.

3,995,517

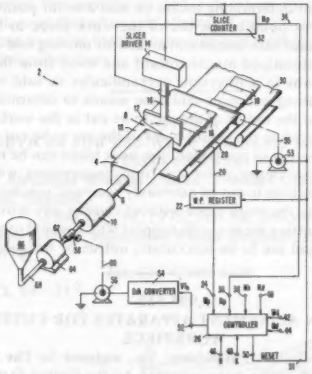
METHOD AND APPARATUS FOR OBTAINING DESIRED BATCH WEIGHT IN A SOLID SLICING CONTROL SYSTEM

Meredith E. Smith, Deerfield, Ill., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,954

Int. Cl.² B26D *1/06*

U.S. Cl. 83—13 **16 Claims**



9. In a solid slicing control system for providing a batch of N slices from said solid, where N has a value between predefined limits, with the total weight of said N slices being substantially equal to a desired batch weight, the combination comprising:

means for feeding said solid, at a selected velocity, into a slicing device which provides slices of a thickness controlled by the feed velocity;

means for weighing a partial batch of less than N slices during said feeding for obtaining a partial batch weight;

means for estimating the value of N based on the number of slices in said partial batch and the ratio of said desired batch weight and said partial batch weight;

means for calculating a predicted termial deviation from said desired batch weight based on said partial batch weight and the ratio batch; and

means for controlling the feed velocity of said solid into said slicing device as a function of the value of said predicted terminal deviation.

3,995,518

MEANS AND METHODS FOR PUNCHING HOLES IN CATHETERS

Carl M. Spiroff, 3117 Davis, Granite City, Ill. 62040

Filed Aug. 28, 1975, Ser. No. 608,573

Int. Cl.² B26F *1/32*

U.S. Cl. 83—54 **10 Claims**

1. The method of punching holes in flexible tubing which method comprises

forming an inner die holder sized for snug-fitting disposition in the hollow portion of the tubing,

forming an outer die contoured to support the tubing wall firmly against the inner die holder,

providing the inner die with an elongated channel which extends axially along the tubing axis and which also includes an axially and radially extending ramp,

locating a die hole in the outer die radially outward from the ramp and in alignment therewith, and

forcibly urging a male punching die along the channel and up the ramp through the tubing wall and the die hole.

3,995,519

ROD-MAKING MACHINES

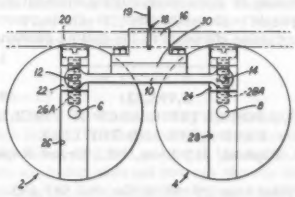
Francis A. M. Labbe, Neuilly-sur-Seine, France; Edward George Preston, London, England; Paul Dingli, London, England, and Ivan Yehudi Hirsh, London, England, assignors to Molins Limited, London, England

Division of Ser. No. 378,451, July 12, 1974, Pat. No. 4,317,437, which is a continuation of Ser. No. 190,496, Oct. 19, 1971, abandoned. This application Sept. 3, 1974, Ser. No. 502,468

Claims priority, application United Kingdom, Oct. 20, 1970, 49844/70

Int. Cl.² A24C *5/28*

U.S. Cl. 83—310 **6 Claims**



1. A ledger for a rod-making machine for supporting a continuous rod at periodic intervals while being cut during

each stroke of a cutting device, comprising two rotary members arranged to rotate at the same speed about parallel axes, each of said rotary members including pivot means spaced radially a predetermined distance from the axis of said rotary member, a connecting member extending between said pivot means of said rotary members pivotally connecting said connecting member to both of the rotary members, a rod support on said connecting member for supporting the rod during each cutting stroke, and a cam device for raising and lowering at least one of the rotary members during each revolution to reduce the vertical movement of the rod-supporting member while it is supporting a rod during cutting.

3,995,520

SUGAR CANE DIVIDING MEANS

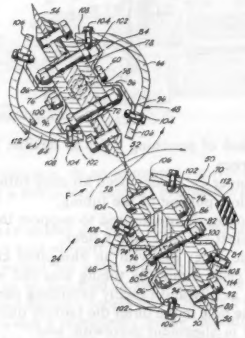
Ronald F. Spargo, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 23, 1975, Ser. No. 580,254

Claims priority, application United Kingdom, June 5, 1974, 24816/74

Int. Cl.² B26D *7/06;* **A01D** *55/18*

U.S. Cl. 83—345 **7 Claims**



1. A sugar cane divider comprising a frame, conveyor means operative to convey cane sticks mounted on the frame, cane dividing means mounted on the frame to receive cane sticks from the conveyor means and operative to cut each stick into at least two billets and billet receiving means mounted on the frame to receive billets from the cane dividing means; the cane dividing means comprising a pair of contra-rotatable cane cutting elements, each of which includes a driven shaft rotatably supported on the frame for rotation about an axis which is substantially perpendicular to the direction of movement of cane sticks into the cane dividing means, at least one blade attached to the driven shaft with a cutting edge radially spaced from and parallel to the axis of the driven shaft, and at least one resilient feed member with a leading edge and a trailing edge both attached to the driven shaft with at least the portion of the resilient feed member between the leading and trailing edge radially spaced from the driven shaft, and drive means to drive each cutting element so that the blades cooperate with each other to divide canes passing between the cutting elements as the cutting elements rotate.

3,995,521

APPARATUS FOR CUTTING ARCS OF CIRCLES WITH BAND SAWS AND THE LIKE

Rouchdy B. Raphael, 319 Lyon, NE., Grand Rapids, Mich. 49503

Filed Mar. 27, 1975, Ser. No. 562,592

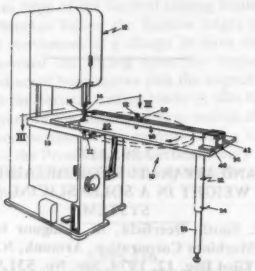
Int. Cl.² B26D *7/06;* **B27B** *13/04*

U.S. Cl. 83—411 R **20 Claims**

1. Apparatus for positioning the center of the circular arc to be cut in a work piece with a band saw or other cutting tool or apparatus, the tool or apparatus being of the type including a work piece supported by the work support table when the work piece is fed into engagement with the cutting means from a predetermined direction, and a support for positioning the cutting means, said apparatus comprising:

base means for engaging the work table of the cutting tool or apparatus and supporting a work piece to be cut, said base means having a first end adapted to fit adjacent the cutting means, a second end remote from the cutting means,

an arm extending toward the cutting means and support means mounted independently of the cutting means or its support at a fixed position on said second end of said base for supporting said arm in cantilevered fashion spaced above said base and the work piece and for positioning



said arm laterally generally perpendicular and at a right angle to said predetermined direction from which the work piece is fed to the cutting means;

center point determining means on said arm for positioning the center point of the arc of the work piece to be cut against said base means and means for moving said center point determined means toward and away from the cutting means in a direction perpendicular to said cutting means along and over said base means to determine the length of the radius of the arc to be cut in the work piece whereby when the center point of the arc to be cut on the work piece is so positioned, the work piece can be rotated about the center point and into engagement with the cutting means to cut an extremely accurate, precise circular arc in the work piece without causing any movement of the cutting means or its support which would otherwise cause said arc to be inaccurate, untrue or irregular.

3,995,522

PRECISION ALINEMENT APPARATUS FOR CUTTING A WORKPIECE

Morriss L. Holliday, Hampton, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,729

Int. Cl.² B26D *7/16*

U.S. Cl. 83—467 R **3 Claims**

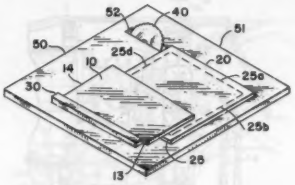
1. A precision cutting apparatus for accurately cutting a workpiece along a designated line which is a known distance from a reference point and at a known orientation to a reference line on the workpiece comprising in combination:

a workpiece having a reference line, a first reference point, and a designated line; said designated line being selectively positioned at a known angle with respect to said reference line and at a known distance from said first reference point;

a fixture means for providing said workpiece with a temporary reference edge; said fixture means having a reference edge and a second reference point which is a precisely known distance from said reference edge said fixture means being removably affixed to said workpiece such

that said reference edge is parallel to said reference line and said first and second reference points coincide; said reference edge extending beyond said workpiece;

a cutting means for cutting said workpiece along said designated line; said cutting means having a blade means for cutting said workpiece fixably positioned to cut in a cutting plane perpendicular to said workpiece; said cutting means also having an alinement means for providing a base line selectively positionable with respect to said cutting plane and displaceable along a line which is parallel to said cutting plane; said line being selectively displaceable with respect to said cutting plane; said alinement means being oriented with respect to said cutting plane at an angle equal to said known angle between said reference line and said designated line and being positioned from said cutting plane a distance equal to the sum of said precisely known distance between said reference edge and said second reference point and said known distance between said first reference point and said designated line; said reference edge cooperating with said adjustable alinement guide to thereby position said designated line parallel to and coincident with said cutting plane so that when said alinement guide is displaced along said line said blade means cuts said workpiece along said designated line.



3,995,523
DEVICES FOR USE WITH STRINGED MUSICAL INSTRUMENTS

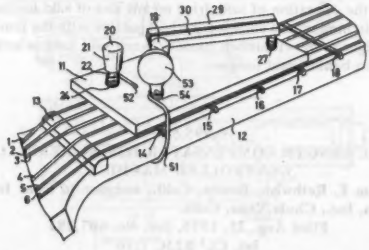
Amos Alexander Graham Clarke, 7 Wharf Close, Abingdon, Oxon, England

Filed July 16, 1975, Ser. No. 596,445

Claims priority, application United Kingdom, July 18, 1974, 31963/74

Int. Cl.² G10D *3/08*

U.S. Cl. 84—317 **9 Claims**



1. A device for use when playing a stringed instrument comprising a base adapted to be fitted to said instrument so as to extend over at least some of the strings thereof, a plurality of manually-operable keys movably carried by said base in positions to engage strings of said instrument when said device is in position thereon, means biasing said keys out of engagement with said strings, at least one cross-bar extending between a pair of said keys, and means flexibly connecting each of said keys of said pair with said cross-bar so that either one of the keys of said pair can be pressed against its respective string without operation of the other key of said pair, and said cross-bar may be operated to press both keys connected therewith against their corresponding strings for the playing of a chord.

3,995,524
AUTOMATIC LOADING APPARATUS FOR DOUBLE-SPINDLE FACE LATHES

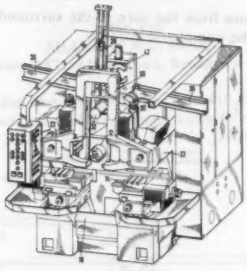
Gerhard Lederer, Saint Georgen, Germany, assignor to J. G. Weisser Sohne, St. Georgen, Germany

Filed Dec. 10, 1975, Ser. No. 639,365

Claims priority, application Germany, Dec. 12, 1974, 2458760

Int. Cl.² B23B *13/00*

U.S. Cl. 82—2.7 **10 Claims**



1. Automatic loading apparatus for double-spindle face lathes with four machining slides, with a workpiece feed chute for the blank parts and with a workpiece discharge chute for the finished parts, comprising a magazine device bracket attached rigidly to the lathe having a substantially vertical guideway, by a loading carriage slidable on this guideway and by a loading spider which is mounted on the loading carriage with sliding mobility in the direction of its median axis and with 90° pivoting mobility about this axis and exhibits workpiece grippers on each of its four arms, while depending upon the pivotal position of the loading spider the one or the other pair of mutually opposite workpiece grippers are aligned with the spindles when the loading carriage is transported downwards and are aligned with a removal aperture of the workpiece feed chute and with a surrender aperture of the workpiece discharge chute when the loading carriage is transported upwards.

3,995,525
METHOD FOR MANUFACTURING DETONATING FUSE-CORD

Joseph Potter Blair, Dundonald, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed May 12, 1975, Ser. No. 576,571

Claims priority, application United Kingdom, May 20, 1974, 22424/74

Int. Cl.³ F42B *3/10*

U.S. Cl. 86—22 **10 Claims**

1. In a method of manufacturing detonating fuse cord by steps which include forming a tube by continuously convoluting a longitudinal tape and passing it through a die, flowing particulate explosive material through the die into the tube while assisting the flow of the particulate explosive material into the tube by drawing at least one center yarn through the die as the cord is formed, and leaving the yarn in the completed cord, the improvement wherein the center yarn which

is passed through the die is a yarn having silicone oil applied thereto prior to passing the yarn through the die whereby the

silicone oil migrates from the yarn to the surrounding explosive material in the completed cord.

3,995,526

METHOD FOR MANUFACTURING DETONATING FUSECORD

Gordon Brian Roger Shannon, Dundonald, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed May 12, 1975, Ser. No. 576,573

Claims priority, application United Kingdom, Dec. 23, 1974, 55442/74

Int. Cl.² F42B *3/10*

U.S. Cl. 86—22 **9 Claims**

1. In a method of manufacturing detonating fusecord by steps which include forming a tube by continuously convoluting a thin transport tape and passing it through a die, and flowing particulate explosive material through the die into the tube, the improvement wherein the tape which is passed through the die is a tape pre-coated with silicone oil on at least that side which forms the interior surface of the tube before the tape contacts the explosive material whereby the silicone oil migrates from the tape to the surrounding explosive material in the completed cord.

3,995,527

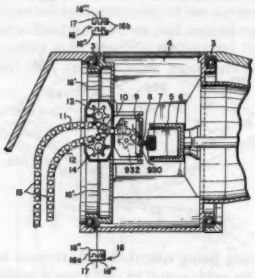
CARTRIDGE BELT FEEDING DEVICE FOR AUTOMATIC WEAPONS

August Schiele, and Siegfried Uhl, both of Augsburg, Germany, assignors to Keller & Knappich Augsburg Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Germany

Continuation-in-part of Ser. No. 440,113, Feb. 6, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,430

Int. Cl.² F41D *9/02*

U.S. Cl. 89—33 SF **7 Claims**



1. A device for selectively feeding two ammunition cartridge belts to an automatic weapon, such as a rapid-firing cannon, wherein two cartridge belt feeders are combined before a common input of the weapon, the device comprising, in combination: first and second, adjacently mounted sprocket wheel means engaging successive cartridges carried by the respective belts; drive means coupled to said wheel means for selectively releasing one of said wheel means for movement of said cartridges in the forward direction, toward the weapon, for regular feed and firing of the cartridges, together with the associated one of the belts to the input of the weapon, which is separate therefrom, and for turning one of said cartridge belts for movement in the rearward direction, away from the weapon, for withdrawing the cartridges when jammed, together with the respective carrying belt portion; switching means mounted adjacent to said wheel means, separate from the weapon, receiving the successive cartridges from said one wheel means, and including a pivotable adjustment tongue disposed between said first and said second wheel means, for selecting one of said belts with the cartridges from one of said wheel means; third sprocket wheel means for receiving the cartridges from said one wheel means and advancing them; and a hydraulically operated gear rack coupled to said third wheel means for positively feeding the cartridges toward the input; the operation of said drive means and of said tongue of the switching means allowing the belt portion with the jammed cartridges to be withdrawn from between said tongue and the input to behind said tongue.

3,995,528

TOOL LENGTH COMPENSATOR FOR NUMERICALLY CONTROLLED MACHINE

William F. Rethwish, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 25, 1975, Ser. No. 607,281

Int. Cl.² B23C *1/16*

U.S. Cl. 90—11 E **12 Claims**

1. A tool length compensator for a numerically controlled machine having a plurality of tools mounted therein for performing, in sequence, and under the control of a computer, work operations upon a work piece secured in adjusted position in such machine, said compensator comprising:

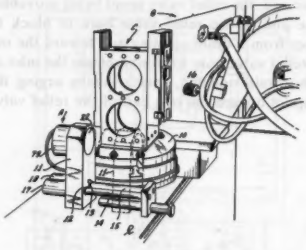
a frame mounted in selected position on the N.C. machine,

a tool engaging member carried by said frame and movable

along a selected path of advance of each of the tools of such N.C. machine,

means resiliently biasing said tool engaging member against a stop in the direction counter to such selected path of tool advance.

a first micro-switch supported by said frame and being actuated by said tool engaging member upon a selected movement of said tool engaging member in a direction opposite to the resilient bias of said tool engaging member, said first micro-switch being operatively embodied in a circuit of the computer controlling the N.C. machine for slowing the rate of advance of a tool of the N.C. machine moving along such path of advance and



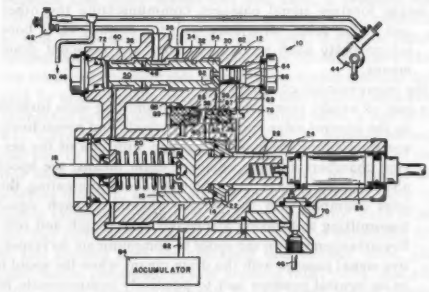
a second micro-switch supported by said frame and being actuated by said tool engaging member upon a further movement of said tool engaging member a selected distance beyond the point at which said tool engaging member actuates said first micro-switch, said second micro-switch being also operatively embodied in such circuit of the computer controlling the N.C. machine for arresting further advance of such tool and notifying the computer that such tool is in its zero position of adjustment, from which position all operative movements of the tool upon such workpiece are computed.

3,995,529

RESERVE SYSTEM ACTIVATION AND MODULATION FOR HYDRAULIC FEEDBACK BRAKE BOOSTERS

Lloyd G. Bach, and Stephen M. Buente, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 9, 1975, Ser. No. 585,282
Int. Cl.² F15B *13/04*
U.S. Cl. 91—28 11 Claims



1. In a vehicle hydraulic system having primary and secondary pressure sources, a hydraulic booster comprising:

a housing defining a pressure chamber therewithin;

a piston slidable in said pressure chamber in response to the fluid pressure level developed in said pressure chamber;

spool valve means shiftably mounted within a first bore in said housing for controlling communication between said primary pressure source and said pressure chamber;

a control chamber within said housing, means responsive to the fluid pressure level in the control chamber to cause shifting of said spool valve means such as to control communication between said primary pressure source and said pressure chamber;

operator-actuated means for developing pressure in said control chamber as a function of the force exerted on the operator-actuated means by the vehicle operator;

pressure differential responsive means shiftably mounted in a second bore in said housing and responsive to the pressure differential between the control chamber and the pressure chamber to shift when the pressure in the control chamber exceeds the pressure in the pressure chamber by more than a predetermined amount; and

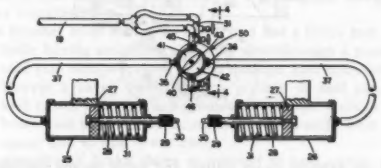
second valve means independent of said spool valve means responsive to shifting of the pressure differential responsive means to communicate the pressure chamber with said secondary pressure source.

3,995,530

SHAKING MACHINE

Robert D. Gunn, 1471 Akins Road, Broadview Heights, Ohio 44141

Filed Oct. 29, 1973, Ser. No. 410,694
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² F15B *21/02*
U.S. Cl. 91—40 9 Claims



1. A shaking machine comprising:

a rotary valve having a circular valve chamber in which a valve element can rotate,

an air inlet and an air exhaust in the circular wall of the valve chamber and a pair of outlets in other locations of the circular wall,

a source of compressed air connected to the air inlet,

a rotating valve element separating the air inlet from one outlet at the same position in which it separates the air exhaust from the other outlet,

power means for continuous rotation of the valve element,

a pair of conduits, each connected to a different one of the air outlets,

a pair of coaxial cylinders each closed at the end most distant from the other cylinder, and each communicating with a different one of the conduits, and

a pair of piston faces, each slidable in one cylinder and biased toward the other when compressed air is admitted to the respective cylinder, for motion in unison when a solid movable structure is interposed between the piston faces.

3,995,531

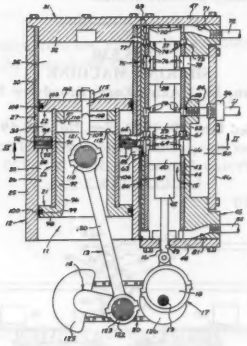
STEAM ENGINE

Joseph Zibrun, 1741 W. 33rd St., Chicago, Ill. 60608

Filed Dec. 19, 1975, Ser. No. 642,360
Int. Cl.² F01B *1/00*; F15B *15/17*
U.S. Cl. 91—152 11 Claims

1. In a steam engine, cylinder means defining internal cylindrical surface means having a vertical axis, piston means reciprocably movable in said cylinder means, a crankshaft

rotatable about a horizontal axis aligned with said vertical axis and below said piston means, a connecting rod having an upper end extending within and pivotally connected to said piston means and having a lower end pivotally connected to said crankshaft, said piston means including an upper end portion having external cylindrical surface means in sealing engagement with said internal cylindrical surface means and including a reduced diameter portion having an external cylindrical surface in concentric relation to said cylindrical surface means, annular means projecting inwardly from said cylinder means into sealing engagement with said external cylindrical surface of said reduced diameter portion, top wall means closing the upper end of said cylinder means, there being a first variable volume space between said annular means and said upper end portion of said piston means and a second variable volume space between said top wall means and said upper end portion of said piston means, a high pressure steam



inlet, an exhaust steam outlet, and valve means operable in synchronized relation to rotation of said crankshaft between a first condition during upward movement of said piston means and a second condition during downward movement of said piston means, said valve means being operable in said first condition to introduce high pressure steam from said inlet to said first space and to permit flow from said second space to said outlet and being operable in said second condition to permit flow from said first space to said second space, said cylinder means including second internal cylindrical surface means along said vertical axis and below said annular means, said piston means including a lower end portion having external cylindrical surface means in sealing engagement with said second internal cylindrical surface means of said cylinder means, there being a third variable volume space between said second end portion of said piston means and said annular means.

3,995,532

PROPORTIONAL CONTROL VALVE WITH PRECONDITIONED INLET MODULATING RELIEF VALVE

John A. Junck, Joliet, and Larry W. Lorimor, Crest Hill, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,748

Int. Cl.² F16K *11/00*

U.S. Cl. 91—411 R **13 Claims**

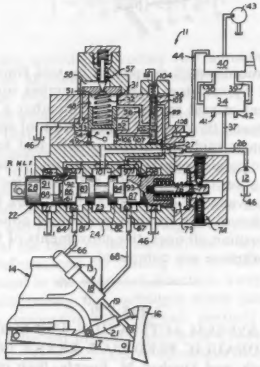
1. In a fluid control circuit for regulating operation of a double-acting hydraulic motor and including

a source of fluid under pressure,

a control valve having a body defining a bore, an inlet chamber in communication with the bore and the source, service cambers respectively in communication with the control valve bore in axially spaced apart relation on opposite sides of the inlet chamber and drain means in communication with the control valve bore adjacent each service chamber,

a spool being reciprocably arranged in the control valve bore and having a neutral position for blocking the inlet chamber from communication with both service chambers, the spool being movable in opposite directions from its neutral position for respectively communicating the inlet chamber with the service chambers and drain means,

an inlet relief valve forming a bore having one end in free communication with the inlet chamber and a spool movably arranged in the bore and separating its one end from its other end, the relief valve spool being movable toward the one end of the relief valve bore to block the inlet chamber from a drain opening and toward the other end of the relief valve bore to communicate the inlet chamber with the drain opening, spring means urging the relief valve spool toward the one end of the relief valve bore,



means forming signal passages communicating the other end of the relief valve bore with the control valve bore intermediate each service chamber and adjacent drain means,

the improvement comprising

a pair of axially elongated signal transmitting slots formed by the control valve spool for selectively and respectively communicating each signal passage with one of the service chambers and the adjacent drain means, the spool also forming means for selectively communicating the inlet chamber with the service chambers, each signal transmitting slot having a selected axial length and relative arrangement on the spool to communicate its respective signal passage with the drain means when the spool is in its neutral position and to positively communicate its signal passage with the respective service chamber substantially prior to communication of the inlet chamber with the respective service chamber in order to precondition the inlet relief valve for commencing modulation of fluid pressure in the inlet chamber prior to communication of the inlet chamber with the respective service chamber.

3,995,533

HYDRAULIC STEERING UNIT

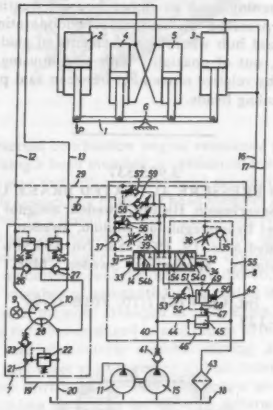
Ulf Martin von Huth Smith, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Feb. 26, 1975, Ser. No. 553,266

Claims priority, application Germany, Mar. 1, 1974, 2409739

Int. Cl.[2] F15B 11/10, 13/042

U.S. Cl. 91—433 1 Claim



1. A hydraulic steering unit comprising a pump means, a drain tank, a working motor having complementary expansible chamber means, a control valve, a pair of parallel supply and exhaust conduits between said working motor and said control valve which are selectively connectable to said pump means and said tank by said control valve, said control valve having a neutral position relative to said conduits, a shunt line between said pump means and said tank, a pressure relief valve in said shunt line, a manually operated valve connected to said pump means and said drain tank, a pair of parallel control lines connected to said manually operated valve which are selectively connectable to said pump means and said drain tank by said manually operated valve, said control lines being connected to opposite sides of said control valve, a pair of one way valve means disposed respectively in parallel between said pair of supply and exhaust conduits and said pair of control lines for operating said control valve to connect said working motor to said shunt line so that said relief valve can relieve excessive pressures in said working motor, each of said one way valve means opening in the direction permitting flow to said control lines for operating said control valve, pilot valve means connected to said pressure relief valve, said pilot valve means being connectable to said pump means through said control valve to a selected one of said supply and exhaust conduits, said pilot valve means having a closed position corresponding to neutral and partially opened positions of said control valve and an open position corresponding to a fully open position of said control valve, said pilot valve means permitting opening of said relief valve only when said pilot valve means is in an open position.

3,995,534

SAFETY ARRESTER FOR ARRESTING A HYDRAULICALLY OPERATED LIFTING RAM OF A HYDRAULIC ELEVATOR

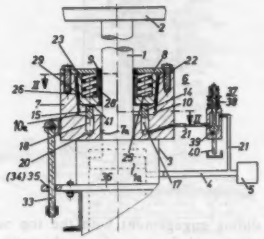
Adolf Rastetter, Hermann-Hesse-Strasse 56, 75 Karlsruhe, Germany

Filed June 27, 1974, Ser. No. 483,799

Claims priority, application Germany, June 30, 1973, 2333491

Int. Cl.[2] F15B 15/26

U.S. Cl. 92—27 8 Claims



1. In a hydraulic elevator drive of the type including a hydraulic cylinder, a piston movable in said cylinder by hydraulic fluid from a fluid pressure source, a lifting ram connected to said piston, and a safety arrester for arresting movement of said ram; the improvement wherein said safety arrester comprises:

an arrester body having an upper end and a lower end, said body having extending upwardly therethrough a passage, said ram being received in said passage, said body having therein a cavity surrounding a portion of said passage, said cavity being partially defined by planar walls of said body, said planar walls being inclined inwardly from said upper end to said lower end;

a plurality of brake shoes positioned in said cavity, said brake shoes comprising segments of a ring surrounding said ram, each said brake shoe having an outer surface including an inclined planar portion corresponding to and cooperating with a respective said planar wall of said body;

a plurality of spring means, one each directly connected to a respective of said brake shoes, for biasing said brake shoes toward said lower end of said body into sliding relationship with said inclined planar walls, and for thereby forcing said brake shoes inwardly into locking frictional engagement with said ram; and

a plurality of hydraulic actuator means, one each directly connected to respective of said brake shoes, actuatable by the pressure of said hydraulic fluid in said hydraulic cylinder for urging said brake shoes toward said upper end of said body against the force of said spring means only when said pressure is above the level sufficient to move said piston and ram.

3,995,535

EXPANSIBLE CHAMBER DEVICE

Russell Ozechowski, 17-37 201 St., Bayside, N.Y. 11360

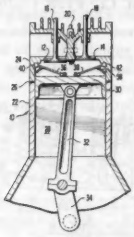
Filed May 23, 1975, Ser. No. 580,208

Int. Cl.[2] F01B 31/14

U.S. Cl. 92—60 9 Claims

1. An expansible chamber device, comprising a hollow body defining a smooth-walled interior cavity having side walls and a closed end; a piston reciprocably disposed in said cavity slidably engaging said side walls and having a substantially flat top surface; flap means pivotally connected to said body only said flap means being positioned inside said cavity adjacent said closed end and slidably engaging the top surface of said piston; first means sealing said flap means with respect to said

body; second means sealing said flap means with respect to the top surface of said piston; said flap means, said top surface of said piston, and said closed end of said cavity cooperating to define a closed, expansible chamber; supply means for communicating a working medium to said expansible chamber; said flap means comprising first and second flaps each pivotally connected at a proximal end to said body on respective opposite sides of said interior cavity with the distal ends



thereof in sliding engagement with the top surface of said piston such that said flaps continuously open as the piston moves away from the closed end of said body to expose a progressively greater area of the top surface of said piston to said working medium while the surface area of said flaps remains constant independent of piston position; the total exposed surface area of the flaps and the piston against which work is performed, by said medium increasing working as said piston moves away from the closed end of said body.

3,995,536

OSCILLATING FLUID-DRIVEN ACTUATOR

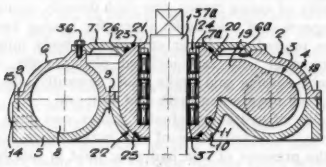
Jens Karl Tenfjord, Tennfjord, Norway, assignor to Johan Tenfjord Mek. Verksted, Norway

Filed Nov. 5, 1974, Ser. No. 521,212

Claims priority, application Norway, Nov. 29, 1973, 4558/73

Int. Cl.² F01C 9/00; F16J 1/00

U.S. Cl. 92—120 **7 Claims**



1. In an oscillating fluid-driven actuator for a driving shaft, of the kind having

i. an actuator housing comprising upper and lower housing members having an internal face defining an annular segment-shaped chamber substantially coaxial with the shaft

ii. an annular segment-shaped piston arranged coaxially with the shaft in the chamber and fixedly connected to the shaft by a central hub having an axis of rotation, and

iii. an arm extending between the hub and the annular piston at a point of said annular piston intermediate its ends, the peripheral extent of the piston being less than 360°, the improvement in which, in combination:

a. said hub of said annular segment-shaped piston has a spherical convex bearing surface which is opposed to and in sliding contact with a corresponding concave spherical bearing surface in said actuator housing, said convex bearing surface and said concave bearing surface both having their centre lying on the axis of rotation of the hub,

b. said piston includes an annular segment-shaped piston body spaced from said internal face of said housing

c. said piston includes a respective sealing head at each circumferential end of said piston body and in sealing engagement with said internal face and slidable along said internal face,

d. said piston includes respective means mounting each sealing head on an end of said piston body, said mounting means being constructed to permit movement of the sealing head within limits relative to the piston in a respective radial plane containing the axis of the hub, said upper housing member having a central top opening, and wherein there is provided a cover covering said top opening, and an upper housing bearing surface being provided on said cover coooperating directly with said hub whereby movements of said shaft and piston, out of coaxiality with said housing, can take place by relative movement between said piston body and sealing heads.

3,995,537

FLUID PRESSURE ACTUATED BRAKE UNIT

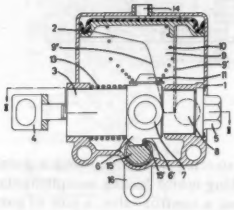
Lars Mattis Severinsson, Hishult, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Mar. 19, 1975, Ser. No. 559,986

Claims priority, application Sweden, Mar. 28, 1974, 7404170

Int. Cl.² F16J 1/10; F01B 31/00

U.S. Cl. 92—129 **6 Claims**



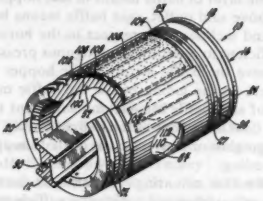
1. A fluid pressure actuated brake unit for a vehicle brake system, comprising in combination, a housing, a cylinder within said housing, a fluid operated piston axially movable in said cylinder, a brake actuating push rod axially movable substantially perpendicular to the axial direction of the piston, a fork-shaped wedge element attached to the piston and including two legs placed astraddle of the push rod for force-transmission from the piston to the push rod, each leg of the wedge element constituting a body disposed to move axially with said piston and presenting two opposite surfaces comprising a substantially planar reaction surface disposed in a movement plane substantially parallel to the axial movement direction of the piston and a substantially planar working surface inclined from said plane parallel to the axial movement direction of said piston and oriented to provide said force transmission to said push rod in said substantially perpendicular direction, a working roller rotatably attached to each side of the push rod for registration and contact with the respective working surface of each said wedge element, and a pair of reaction rollers rotatably attached to the housing of the unit for respective registration and contact with each of the reaction surfaces of said wedge element without movement of either said working or reaction rollers in said axial movement direction, whereby each wedge leg is disposed for movement by said piston to present said surfaces between one said roller attached to the push rod and one said roller attached to the housing.

3,995,538

CROSSHEAD PISTON ASSEMBLY

John M. Beardmore, South Lyon, and David E. Bennett, Dearborn Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 30, 1975, Ser. No. 582,231
Int. Cl.² F16J 1/04, 1/14
U.S. Cl. 92—190 2 Claims



1. An internal combustion engine crosshead piston assembly comprising a head member, a cylindrical inner skirt member having one end adjacent said head member, a piston pin for pivotally connecting both said head member and said inner skirt member to a piston rod while permitting relatively small angular movement between these members, said inner skirt member having an outer annular recess extending from said one end to a point adjacent the other end thereof, a cylindrical outer skirt member of substantially less radial thickness than said inner skirt member arranged in said recess, a cylindrical elastomeric member arranged in said recess between said skirt members, said elastomeric member having an inner side bonded to said inner skirt member and an outer side bonded to said outer skirt member, said elastomeric member having axially extending air spaces for allowing deformation thereof in the diagonally opposite thrust areas of said skirt members, and said outer skirt member extending substantially radially outwardly of both said head member and said inner skirt member whereby said elastomeric member is effective to both distribute and transmit any radial thrust loads acting on said inner skirt member to said outer skirt member with a relatively low spring rate and relatively high energy absorption factor to thereby reduce piston-slap-caused noise.

3,995,539

APPARATUS FOR ERECTING CARTONS

Kay Arne Wallin; Bengt Anders Ewjen, and Jan Ingemar Nilsson, all of Halmstad, Sweden, assignors to Sprinter Pack AB, Halmstad, Sweden

Continuation-in-part of Ser. No. 359,449, May 11, 1973, Pat. No. 3,893,380. This application Dec. 19, 1974, Ser. No. 534,366
Int. Cl.² B31B 1/46
U.S. Cl. 93—51 HW 10 Claims

1. Apparatus for erecting a carton from a carton blank having a tray portion comprised of a tray bottom and four hingedly connected side panels surrounding said tray bottom and a lid portion having a lid bottom and four hingedly connected side panels surrounding said lid bottom and a common panel section hingedly connected to one tray portion side panel and one lid portion side panel said apparatus comprising:

receiving means for receiving the blank;

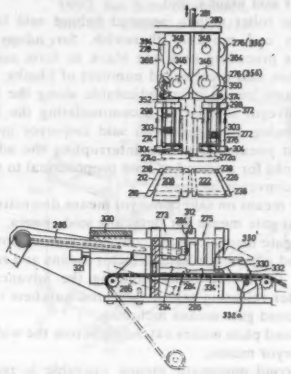
means for supporting the hinged connection between the common panel section and the said one tray portion side panel and being movable within said receiving means;

reciprocating means positioned above said receiving means and movable in first and second opposing directions respectively towards and away from said supporting means;

a plunger assembly comprised of plunger halves each having blank engaging surfaces positioned on opposite sides of said supporting means;

means for swingably mounting said plunger halves to said reciprocating means so that the blank engaging surfaces are always maintained substantially parallel to one another;

means movable in a first direction for swinging said carton blank engaging surfaces downwardly and towards said



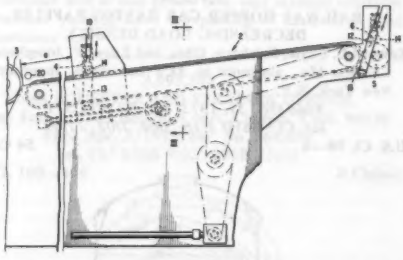
supporting means while maintaining their parallel relationship whereby said surfaces initially respectively engage the tray and lid bottoms and the adjacent ends of said surfaces and engage the common panel section and the tray portion side panel hingedly connected thereto and move said common panel section and said hingedly connected tray side panel towards one another.

3,995,540

APPARATUS FOR STACKING, ALIGNING, AND DISCHARGING PAPERBOARD BLANKS

Martinus Christiaan Huiskes, Almelo, Netherlands, assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 1, 1975, Ser. No. 592,340
Claims priority, application Netherlands, July 10, 1974, 7409309
Int. Cl.² B31B 1/98
U.S. Cl. 93—93 DP 8 Claims



1. Apparatus for stacking, aligning, and discharging folded corrugated paperboard blanks comprising:

a conveyor means, operable in synchronism with blank advancing apparatus, for receiving blanks advancing faster than said conveyor means to form a stream of uniformly shingled blanks thereon;

a first gate means on said conveyor means for momentarily interrupting the advance of said blanks to form spaces between preselected numbers of blanks downstream from said first gate means, and first gate means including:

a. a first plate means extending across the width of said conveyor means;

b. a first pneumatic means, operable in response to a preselected number of blanks advancing onto said conveyor means, for moving said first plate means from a disengaged position above said conveyor means to an engaged position for contact with the leading edge of one of said blanks; and

c. a first roller means, secured behind said first plate means and movable therewith, for advancing the blanks preceding said one blank to form said spaces between said preselected numbers of blanks;

said first gate means being adjustable along the length of said conveyor means for accommodating the length of blanks being advanced onto said conveyor means and said first pneumatic means interrupting the advance of said blanks for a period of time proportional to the speed of said conveyor means;

a detector means on said conveyor means downstream from said first gate means for detecting said spaces;

a second gate means on said conveyor means, downstream from and adjacent to said detector means and responsive thereto for momentarily stopping the advance of and thereafter releasing said preselected numbers of blanks, said second gate means including:

a. a second plate means extending across the width of said conveyor means;

b. a second pneumatic means, operable in response to said detector means detecting a space between said preselected numbers of blanks, for moving said second plate means from a disengaged position above said conveyor means to an engaged position for contact with said preselected numbers of blanks advancing from said first gate means; and

c. a second roller means, secured behind said second plate means in cooperative engagement with a lower roller means on said conveyor means, for advancing said preselected numbers of blanks released by said second plate means;

and

stacking, aligning, and discharge means adjacent the downstream end of said conveyor means for receiving said preselected numbers of blanks released by said second gate means to form stacks of blanks of preselected number, simultaneously align all the blanks in such stacks, and discharge the same in a direction perpendicular to the advance of said shingled blanks along said conveyor means.

3,995,541

RAILWAY HOPPER CAR HAVING BAFFLES DECREASING LOAD DENSITY

Edward L. Coyle, Fairborn, Ohio, and Edgar F. Josephson, St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,379

Int. Cl.[2] B61D *3/16, 5/04, 7/02, 21/00*

U.S. Cl. 98—6 **54 Claims**

1. A transportation hopper comprising:

A. a hopper having a plurality of hopper walls;

B. a loading inlet adapted to load a lading to be transported into said hopper;

C. a lading discharge opening in the lower portion of said hopper;

D. an outlet comprising a closure movable between an open position for discharging the lading, and a closed position wherein the lading is retained in said hopper;

E. at least one layer of baffle means in said hopper vertically spaced above said outlet, said baffle means being generally flat and inclined with respect to the horizontal at an angle sufficient to reduce the contiguous pressure that the lading above the baffle means in the hopper would normally exert on the lading below the baffle means in the absence of said baffle means, and sufficient to allow the lading to flow in and out of the hopper during loading and unloading, and obtain efficient fill of hopper volume during loading:

and support means mounting said baffle means spaced from the walls of said hopper a distance sufficiently large for lading to pass therearound during loading and unloading, and obtain efficient fill of hopper volume during loading, said support means being of sufficient size to transmit to the hopper a sufficient portion of one weight of the lading above the baffle means such that the remainder of the weight of the lading transmitted to the lading below the baffle means through said spaced distance can be supported by the lading below the baffle means without significant damage to the lading below the baffle means;

and at least some of the baffles in said baffle means having at least one lading opening therein of size sufficiently large for lading to pass therethrough during loading and unloading, and to obtain efficient fill of hopper volume during loading; said baffle means being of sufficient size to transmit to the hopper through said baffle means and said support means a sufficient portion of the weight of the lading above the lading openings in the baffle means such that the weight of the lading above the baffle means transmitted through the lading openings in said baffle means to the lading below the baffle means will not cause significant damage to the lading below the baffle means.

29. A railway hopper car comprising:

A. trucks at opposite ends of the car supporting a plurality of hoppers extending longitudinally in the car;

B. each of said hoppers having a loading inlet adapted to load a lading to be transported into said hopper;

C. a lading discharge opening in the lower portion of said hoppers;

D. an outlet having a closure removable between an open position for discharging the lading, and a closed position wherein the lading is retained in said hoppers;

E. at least one layer of baffle means in said hopper, said baffle means being generally flat and inclined with respect to the horizontal, and adapted to reduce the contiguous pressure that the lading above the baffle means in the hopper would normally exert on the lading below the baffle means in the absence of said baffle means; and support means mounting said baffle means spaced from the walls of said hopper a distance sufficient for lading to pass therearound during loading and unloading, and to obtain efficient fill during loading said support means being of sufficient size to transmit to the hopper a sufficient portion of the weight of the lading above the baffle means such that the remainder of the weight of the lading above the baffle means transmitted to the lading below the baffle means through said spaced distance can be supported by the lading below the baffle means without significant damage to the lading below the baffle means; and at least some of the baffles in said baffle means having at least one lading opening therein of sufficient size for lading to pass therethrough during loading and unloading and obtain efficient fill during loading; said baffle means being of sufficient size to transmit to the hopper through said baffle means being of sufficient size to trans-

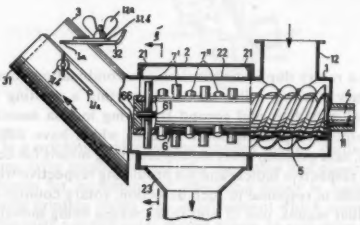
mit to the hopper through said baffle means and said support means a sufficient portion of the weight of the lading above the lading openings in said baffle means such that the weight of the lading above the baffle means transmitted through the lading openings in the baffle means to the lading below the baffle means will not cause significant damage to the lading below the baffle means.

3,995,542

APPARATUS FOR PROCESSING CEREAL GRAINS

Wolfgang Miecke, Broitzen, Germany, assignor to Bühler-Miag GmbH, Braunschweig, Germany

Filed Aug. 14, 1974, Ser. No. 497,488
Claims priority, application Germany, Aug. 23, 1973, 2342516
Int. Cl.² B02B 3/08, 5/02; B07B 1/06; A23N 5/06
U.S. Cl. 99—569 7 Claims



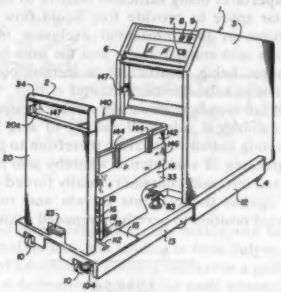
7. Apparatus for shelling cereal grains comprising a horizontally oriented tubular screen having spaced ends and a predetermined diameter; a housing surrounding said screen and having a grain inlet axially spaced from one of said ends; a shaft extending through said housing and having a first portion configurated as a feed screw and positioned adjacent to one end to receive grain from said inlet and convey the grain into and axially through the screen and a second portion located within the confines of said screen; at least one group of pins projecting radially from said second portion for agitating the grain in the screen; and outlet means comprising a tubular member communicating at one end thereof with said other of said ends of said screen for receiving shelled grain from the latter, said one end of said tubular member being coaxial and of the same diameter as said predetermined diameter of said screen to avoid any dead spaces between said other end of said screen and said one end of said tubular member, said tubular member having an output opening axially spaced from said other end, and said output means further comprising a conical member mounted in the region of said output opening and having a tip extending into the latter, a threaded spindle coaxial with said tubular member and mounted for displacement axially of the same, said conical member being mounted on said spindle for axial displacement relative thereto, and biasing means resiliently urging said conical member in a direction inwardly of said output opening, said biasing means comprising an inner helical expansion spring surrounding said spindle and bearing upon the latter and said conical member, and a conical outer helical expansion spring which also surrounds said spindle and bears upon the same and upon said conical member, said outer spring being weaker than said inner spring.

3,995,543

COMPACTING APPARATUS

Anthony P. Montalbano, Freshmeadows, N.Y., assignor to Constance Radice, Great Neck, N.Y.

Division of Ser. No. 337,567, March 2, 1973, Pat. No. 3,868,903. This application Mar. 4, 1975, Ser. No. 555,191
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.
Int. Cl.² B30B 1/18, 15/14
U.S. Cl. 100—53 20 Claims



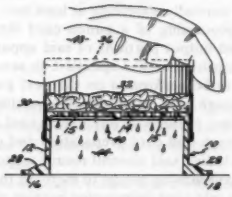
1. A compacting apparatus comprising:
a power unit; and
a container unit adapted to be removably received in said power unit;
said power unit comprising:
means for receiving said container unit in said power unit;
a ram unit operable to compact material in said container unit when said container unit is received in said power unit; and
said container unit comprising:
means for guiding said container unit into said power unit; and
a container for receiving material to be compacted, said container being in registration with said ram when said container unit is received in said power unit for compaction of said material; and
said power unit further including at least one resilient rotatable member mounted to the lower surface thereof said at least one resilient rotatable member being engageable with said container unit for facilitating reception of said container unit in said power unit, said resilient rotatable member yielding upon compacting of material in said container unit.

3,995,544

TUNA SQUEEZER AND STRAINER UTENSIL

D. Gray Farley, 5803 Holmby Court, Cypress, Calif. 90630

Filed Apr. 3, 1975, Ser. No. 564,690
Int. Cl.² B30B 9/02; B01D 35/00
U.S. Cl. 100—116 8 Claims



1. A utensil for the separation of liquid from subdivided comestibles within a right cylindrical can container of conventional size which comprises:

a right cylinder cup member having a ratio of height to diameter from 0.25 to about 1.5 and having smooth and flat cylindrical side walls, said diameter closely conforming to the internal diameter of said can container to be in substantial contact with the internal wall of said can container when placed therein and provide an annular space therebetween of minimal width, and a circular end wall carried thereon;

a plurality of apertures uniformly distributed about said end wall and extending therethrough, the total flow area of said apertures being sufficient relative to the area of said annular space to provide free liquid flow through said apertures to the substantial exclusion of liquid flow through said annular space and the area of each of the apertures being insufficient to permit passage of said subdivided solid comestibles; and

a pair of tab members, one each carried on opposite sides of said cylindrical side wall distally of said end wall and projecting radially outwardly therefrom to provide means for grasping of said utensil whereby said utensil can be inserted into said container, axially forced into compression against the contents therein and rotated into an inverted position to permit unimpeded drainage from said can.

3,995,545

CARD ADVANCEMENT MECHANISM

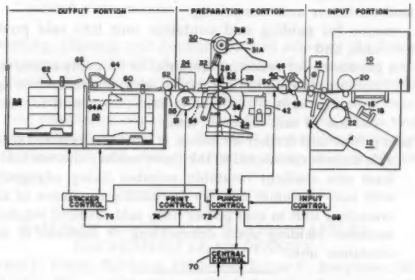
Albert J. Romeo, Center Square, and Edward G. Sherbert, Plymouth Meeting, both of Pa., assignors to Decision Data Computer Corporation, Horsham, Pa.

Filed Oct. 1, 1973, Ser. No. 402,328

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² B44B *5/00*

U.S. Cl. 101—19 **8 Claims**



1. A punch card apparatus comprising an input portion, a card preparation portion, and an output portion, control means operatively connected to each of said portions, said control means connected to control the timing of punch cards being processed through said input, card preparation and output portions of said apparatus, means including said control means for normally allocating at least two clocking cycles to effect the processing of a punch card through said card preparation and output portions of said apparatus, said control means comprising means operative to sense the nature of the operation to be performed on the next punch card to be processed through said apparatus and additional means to sense the relative position of any punch card currently being processed through said card preparation and output portions, and means including said control means responsive to signals generated to said sensing means to increase the throughput of punch cards in said card preparation portion of said apparatus such that a subsequently processed punch card will be processed through said card preparation and output portions of said apparatus in a lesser number of clocking cycles than is normally allocated to the processing thereof.

3,995,546

ROTARY DUPLICATING MACHINE

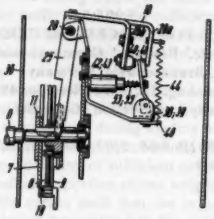
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

Continuation of Ser. No. 347,920, April 4, 1973, abandoned. This application Dec. 10, 1975, Ser. No. 639,229

Claims priority, application Germany, Apr. 18, 1972, 2219489

Int. Cl.² B41L *47/46*

U.S. Cl. 101—91 **4 Claims**



1. In a rotary duplicating machine, a combination comprising rotary printing roller means supporting a printing form provided with first and second triggering indicia associated with respective printing form sections which have different lengths, said printing roller means including means for detecting the respective indicia and for producing respective triggering signals in response to such detection; rotary counter-pressure roller means, one of said roller means being movable to and from a printing position in close proximity to the other roller means and defining with said other roller means a printing line through which said sections of said printing form must pass; operating means connected to said movable roller means for moving said movable roller means to and from said printing position; control means including a selectively associatable first cam and second cam, and means for selectively associating said first cam with said operating means to thereby move said movable roller means to said printing position in response to detection of one of said indicia and for a first time period the length of which depends upon the length of the one printing form section associated with said one indicium and during which first time period said printing roller means turns through a first angle corresponding to the length of said one printing form section, and for selectively associating said second cam with said operating means to thereby move said movable roller means to said printing position in response to detection of the other of said indicia and for a second time period the length of which depends upon the length of the other printing form section associated with said other indicium and during which second time period said printing roller means turns through a different second angle corresponding to the length of said other printing form section; cam actuating means associated with said control means and including spring means permanently urging said cams towards association with said operating means, abutment means movable to and from blocking positions blocking the movement of said cams into association with said operating means, and electromagnetic means responsive to said triggering signals to move said abutment means away from said blocking position so as to permit movement of the respective cams into association with said operating means; and restoring means for restoring said abutment means to said blocking positions and for moving said cams out of association with said operating means.

3,995,547

COMPACT FLYING PRINTER

Tadayoshi Shimodaira, Suwa, and Yoshifumi Gomi, Chino, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Suwa, both of Japan

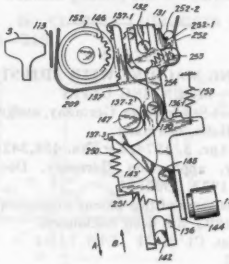
Continuation-in-part of Ser. No. 445,420, Feb. 25, 1974, Pat. No. 3,949,664, which is a continuation of Ser. No. 248,368, April 28, 1972, Pat. No. 3,835,770, which is a division of Ser. No. 118,427, Feb. 24, 1971, Pat. No. 3,795,185. This application May 20, 1975, Ser. No. 579,164

Claims priority, application Japan, Feb. 27, 1970, 45-16451

The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.

Int. Cl.² B41J 9/36

U.S. Cl. 101—93.31 8 Claims



1. In a printing device having printing means, continuously rotating drive means for said printing means and paper engaging means for incrementally advancing paper in registration with said printing means, the improvement which comprises a continuously rotating rotor means driven by said drive means; a reciprocatable member proximate said rotor means and movable in first and second directions opposite to each other; guide means for guiding and limiting the excursion of said reciprocatable member; a transmitting member pivotably mounted on said reciprocatable member and having a rack portion engageable with said rotor and a cam portion; interengaging means on said rack portion and rotor means so that said rack portion and therefore said transmitting member is displaced in said first direction when said rack portion is engaged against said rotor means; means normally biasing said reciprocatable member against said guide means in said second direction toward a rest position; a detent member pivotably mounted on said reciprocatable member; trigger means for selectively pivotably displacing said detent member; respective cooperating means on said detent member and transmitting member for normally holding said transmitting member at a first position at which said rack portion is out of engagement with said rotor means and for pivotably displacing said transmitting member in response to the pivotable displacement of said detent member by said trigger means into a second position at which said rotor means is operatively engaged by said rack portion for displacing said reciprocatable member in said first direction; stopper means for disengaging said transmitting member rack portion and said rotor after a predetermined displacement of said reciprocatable member in said first direction, thereby permitting displacement of said reciprocatable member to said rest position in said second direction in response to the energy stored in said means biasing said reciprocatable member; and paper feeding means coupling said transmitting means and said paper engaging means for effecting incremental advance of said paper in response to the displacement of said transmitting member.

3,995,548

METHOD OF TENSIONING AND PRINTING A WEB ON AN ENDLESS BLANKET

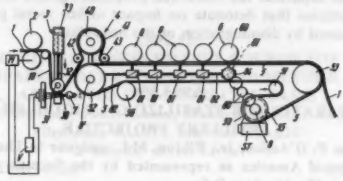
Mathias Mitter, Verl-Sende-Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

Division of Ser. No. 483,698, June 27, 1974. This application Jan. 16, 1975, Ser. No. 541,413

Claims priority, application Germany, June 28, 1973, 2332864; Jan. 8, 1974, 2400729

Int. Cl.² B41F 1/12

U.S. Cl. 101—426 2 Claims



1. A method of printing a traveling textile web having limited dimensional stability and tending to form bulges, comprising the steps of advancing a printing blanket in a path at a first speed toward a downstream end of the path; advancing a web at a second speed which is slower than said first speed; guiding the web onto said printing blanket in the region of an upstream end of the path so that it is supported thereon in substantial surface to surface contact and travels along said path; retarding said web against acceleration to said first speed, the web becoming uniformly tensioned where it is supported on said printing blanket due to the friction resulting from the slippage excused by the differential between said first and second speeds so that the formation of bulges and other interference with the dimensional stability of the web is avoided; and printing onto the thus supported web.

3,995,549

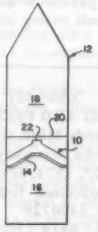
ROCKET/MISSILE MOTOR EXPLOSIVE INSERT DETONATOR

Arthur L. Mullen, Jr., King George County, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1975, Ser. No. 559,281

Int. Cl.² F42B 13/12, 13/28

U.S. Cl. 102—56 SC 3 Claims



1. A rocket detonator insert initiated by sympathetic detonation from a warhead for exploding unburned rocket motor propellant grains to enhance the destructive effect of the warhead comprising:

a head plate separating a rocket into a warhead portion and a rocket motor portion, said head plate formed in a frusto-conical shape with its apical side facing said warhead portion and the base side in contact with an inner wall portion of said rocket,

a pair of frusto cones one inside of and spaced from the other in parallel relationship, the two sides being parallel to each other at the bottom to form a hollow chamber between the sides and having the inside frusto cone of said pair of frusto cones positioned in intimate contact with said head plate,

a charge of explosive filling said hollow chamber to form single shaped chamber member having a diameter dimension equal to said head plate diameter dimension;

whereby the charge of explosive is ignited by sympathetic detonation from the warhead to generate a shock wave that separates the unburned propellant grains into small particles that detonate on impact of hot metal particles caused by disintegration of the headplate.

3,995,550

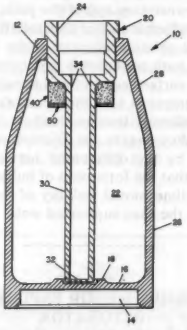
APPARATUS FOR STABILIZING A LIQUID FILLED ARTILLERY PROJECTILE

William P. D'Amico, Jr., Elkton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 3, 1975, Ser. No. 637,358

Int. Cl.² F42B *13/14, 13/44*

U.S. Cl. 102—66 **8 Claims**



1. Apparatus for stabilizing a liquid-filler artillery projectile, which comprises:

a shell casing;

cavity means formed within said shell casing for containing a liquid payload;

porous foam means positioned within said cavity means for causing said liquid payload to quickly spin-up to the spin velocity of said shell casing after being fired from an artillery weapon.

3,995,551

WEB TENSIONING AND FEEDING APPARATUS

Mathias Mitter, Verl-Sende-Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

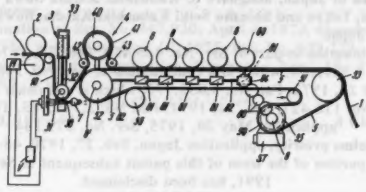
Filed June 27, 1974, Ser. No. 483,698

Claims priority, application Germany, June 28, 1973, 2332864; Jan. 8, 1974, 2400729

Int. Cl.² B41F *15/24, 13/02*

U.S. Cl. 101—118 **25 Claims**

3. In a web printing apparatus, a combination comprising a movable printing blanket; first advancing means for advancing said printing blanket at a first speed and in a predetermined direction; second advancing means for advancing said web onto said printing blanket at a second speed which is slower than said first speed; combined guide means and means for preventing said web from being accelerated to said first speed by said printing blanket and for guiding said web directly onto the advancing printing blanket to be supported on the same in substantial surface to surface contact so that the web is tensioned due to the slippage caused by the differential between



said speeds and the frictional engagement of said web with the printing blanket; and printing means for printing onto said web which is supported on said printing blanket.

3,995,552

SCREEN PRINTING MACHINE WITH ADJUSTABLE END MOUNTING UNITS

Mathias Mitter, Verl-Sende Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

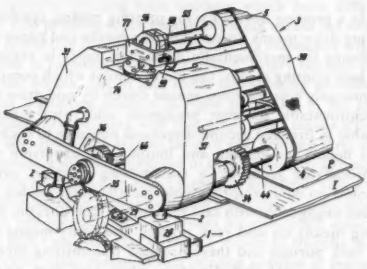
Filed Apr. 5, 1974, Ser. No. 458,342

Claims priority, application Germany, Dec. 1, 1972, 2358892; Jan. 8, 1973, 2300581

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.² B41F *15/08, 15/34*

U.S. Cl. 101—122 **16 Claims**



1. In a screen printing machine, a combination comprising a pair of transversely spaced first guide rollers mounted for rotation about first axes located in a common substantially horizontal plane; a second adjusting roller mounted for rotation about a second axis which substantially parallels said first axes and is located in a higher second plane; an endless printing screen band placed about said rollers for entrainment by the same and defining in the space between said first rollers a printing run; squeegee means for forcing printing ink through said printing screen intermediate said first rollers; first adjusting means for raising and lowering said second roller with reference to said first rollers so that said second roller controls the tension of said printing screen band; second adjusting means for displacing said second roller in said second plane transversely of said second axis so that said second roller controls the position of said printing screen band in said printing run relative to the axial elongation of said first guide rollers; a first end-mounting unit mounting the one axial ends of said rollers for rotation; a second end-mounting unit mounting the other axial ends of said rollers for rotation; a support; lifting means for lifting and lowering said mounting units with reference to said support; and means for shifting at least one of said mounting units in horizontal direction with reference to said support, comprising a plate on said support and carry-

ing said lifting means, and bolt means connecting said plate with said support and being operative for displacing said plate horizontally with reference to said support, said bolt means having two axially spaced portions each connected with one of said plate and said support, and said portions being eccentric with reference to one another.

3,995,553

PAPER WEB THREADING APPARATUS FOR ROTARY PRINTING PRESSES

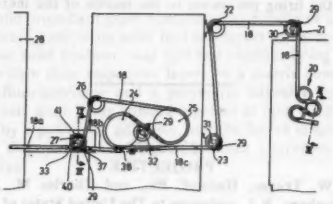
Johann Winterholler, Friedberg; Hans Jörg Laubscher, Augsburg; Bernd Heinrich, Derching, and Josef Plantsch, Augsburg, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Jan. 21, 1975, Ser. No. 542,808

Claims priority, application Germany, Jan. 22, 1974, 2402768

Int. Cl.² B41F 13/54; G03B 1/58

U.S. Cl. 101—228 18 Claims



1. A rotary printing press having a paper web threading apparatus comprising

at least one threading element (17) which is flexible and elongated, extends across each side of the press, is of finite length, and has a leading end and a trailing end and is movable along a threading path;

paper gripping means (51) secured to the threading element to grip the leading edge of the paper web;

a plurality of compressed air motors forming drive elements (30–33) fixed to the frame, located along said path in spaced positions and engageable with said at least one threading element (17) to move the same, the length of said threading element being longer than the maximum distance between said compressed air motors;

and a plurality of switch means (29) each controlling one of said compressed air motors located along said path, operated by the presence of the leading end of the threading element adjacent a compressed air motor, to energize the respective compressed air motor then adjacent the trailing end of the threading element.

3,995,554

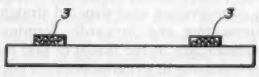
PROCESS FOR PREPARING RESILIENT BLOWN IMAGED PRINTING MASTERS

John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,369

Int. Cl.² B41C 3/06

U.S. Cl. 101—401.1 12 Claims



1. A method of forming a resilient image on a printing master comprising, providing a developed imaged printing master, providing a conversion imaging fluid comprising an expandable polymer containing an encapsulated blowing agent, depositing said conversion imaging fluid on the image of said imaged printing master, and activating said blowing agent to expand said polymer and form a resilient relief image.

3,995,555

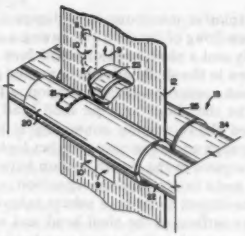
REMOVABLE REDEEMABLE COUPON FOR NEWSPAPER ADVERTISEMENTS AND METHOD AND APPARATUS FOR PRODUCING SAME

Frank E. Stewart, 1921 Judson, Manhattan, Kans. 66502

Filed June 4, 1975, Ser. No. 583,621

Int. Cl.² B41L 15/14

U.S. Cl. 101—426 8 Claims



1. A method of printing of news and advertising on a paper strip in a rotary press to form a newspaper with removable coupons or mailers separable on a tear line formed therein:

a. providing a rotary press having at least three pairs of printing plate cylinders and blanket cylinders, said blanket cylinders each having blanket thereon, and moving a web of paper to be printed between the plate cylinders and the respective blanket cylinders of each pair in sequence;

b. preparing printing plates with relief printing images thereof including a display advertisement with images for a coupon therein spaced from edges of the plates;

c. locating and securing the printing plates on the printing plate cylinders of two pairs of the plate cylinders and blanket cylinders for printing both sides of a web moved therebetween;

d. preparing a third printing plate with raised perforating members arranged to correspond to boundaries of the coupon;

e. locating the area of the blanket cylinder of the third pair that will register with the coupon on the web passing thereby;

f. providing on said area a cushion sheet larger than the coupon and adhering said cushion sheet to the blanket on the third blanket cylinder without spoiling the blanket for subsequent use as a blanket to cover and extend beyond all portions of the area of said blanket on the third blanket cylinder that registers with the coupon;

g. locating and securing the third printing plate to the printing cylinder of the third pair with the perforating members registering with boundaries of the coupon on the web passing between the third pair; and

h. feeding and moving a paper web between the pairs of cylinders to print the faces of the web and perforate the web to define a tearable boundary to the coupon with the web being between the perforating members and the cushion sheet carried by the blanket when the perforations are formed.

3,995,556

PERCUSSION FUSE FOR AN EXPLOSIVE MUNITIONS SHELL

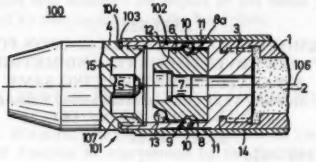
Willi Lüebbers, Trittau, Germany, assignor to Hanns-Juergen Diederichs KG, Trittau, Germany

Filed June 4, 1975, Ser. No. 583,852

Claims priority, application Germany, June 4, 1974, 2426838

Int. Cl.² F42C *1/00*

U.S. Cl. 102—73 R 10 Claims



1. In an explosive munitions shell disposed in a cartridge separable upon firing of the shell and having a charge-containing shell body and a shell head disposed forwardly of and in spaced relation to the shell body, an improved percussion fuse assembly which comprises, in combination, a fuse body interconnecting the shell body and the shell head, the fuse body having a fixed sleeve portion containing at least one radial bore therethrough and an impact member lockably supported for axial movement in the sleeve portion between a rearmost rest position and a frontmost impact position, a percussion cap carried by the impact member, a primer extending rearwardly from the rear surface of the shell head and engageable with the percussion cap when the impact member is in its frontmost position, the impact body having a substantially V-shaped annular groove disposed in the periphery thereof in radial alignment with the first bore of the sleeve member when the impact member is in its rearmost position, a first blocking sphere seatable in the aligned first bore and peripheral groove to normally prevent substantial forward motion of the impact member, and a puncturable closure membrane disposed over each first bore of the sleeve portion in contact with the associated first sphere to normally confine the associated first sphere in its seated position, and to thereby normally maintain the impact member in its rearmost position, after the cartridge is separated.

3,995,557

BASE FUZE FOR A SPINNING PROJECTILE

Walter Engel, Dubendorf, and Paul Cahannes, Zurich, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

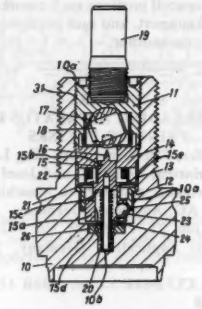
Filed Nov. 13, 1975, Ser. No. 631,672

Claims priority, application Switzerland, Nov. 20, 1974, 15428/74

Int. Cl.² F42C *15/22*

U.S. Cl. 102—79 5 Claims

5. A base fuze for a spinning projectile comprising a detonator cap, a firing pin for piercing said detonator cap, hammer means at which there is carried said firing pin, spring means for displacing the hammer means together with the firing pin towards the detonator cap, centrifugal locking means for holding the hammer means in a rest position spaced from the detonator cap, inertia body means located adjacent said hammer means, said inertia body means having a front end face defining a front contact surface, said hammer means having a rear end face defining a rear contact surface, said front contact surface and said rear contact surface confronting one another, said inertia body means bearing with said front contact surface at said rear contact surface of said hammer means upon impact of the projectile in order to increase the mass of the hammer means during piercing of the detonator



cap by the firing pin owing to the inertia of the inertia body means.

3,995,558

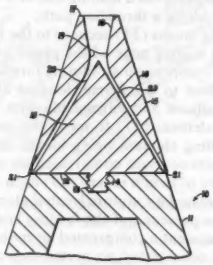
PROJECTILE

Bruce W. Travor, Holland, Pa., and Charles M. Johnson, Willingboro, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,052

Int. Cl.² F42B *13/00*

U.S. Cl. 102—92.4 3 Claims



1. In a projectile having a nose tip member threadedly secured to a main body portion having a transverse annular frontal surface, said nose member and said body portion each having a conical lateral surface in substantial mating alignment with each other,

said nose member having means for changing an environmental supply of air to a constant operative reattachmental laminar boundary layer air stream flow over said body portion lateral surface, said changing means including a forwardly opening air intake throat defining nozzle and a plurality of individual unobstructed straight passageways each intersecting and forwardly terminating with the others substantially at the throat of said nozzle and rearwardly terminating in a rearmost outlet port adjacent said body portion conical surface, said passageway ports including diametrically opposed pairs of outlet ports, each pair of outlet ports being diametrically spaced by a distance substantially equal to the diametrical distance across said main body frontal surface.

3,995,559

PROPELLANT GRAIN WITH ALTERNATING LAYERS OF ENCAPSULATED FUEL AND OXIDIZER

Harold C. Bice, Penns Grove, N.J.; Manville I. Bro, Wilmington, Del., and John R. Dalton, Broomall, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 21, 1962, Ser. No. 205,180
Int. Cl.² C06B 45/06, 45/12
U.S. Cl. 102—100 6 Claims

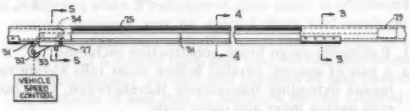
1. A solid propellant grain comprising a plurality of layers of encapsulated particulate solid fuel and layers of encapsulated particulate solid oxidizer, said fuel and oxidizer being encapsulated within their respective layers by a matrix comprising polytetrafluoroethylene and a polymeric adhesive, adjacent layers in said grain being bonded together at their confronting surfaces by a polymeric adhesive, and the layers in said grain being so disposed that a layer of oxidizer alternates with a layer or fuel.

3,995,560

RAIL OBSTRUCTION SENSING MEANS FOR A RAIL TRANSPORTATION SYSTEM

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed Aug. 12, 1975, Ser. No. 603,951
Int. Cl.² B61B 13/00
U.S. Cl. 104—1 R 7 Claims



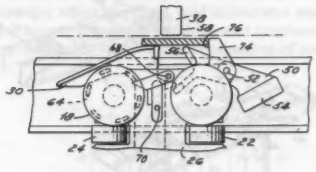
1. In a rail transportation system including a vehicle adapted for travel along a track comprising at least one elongated rail, said vehicle having a speed control mechanism for controlling the speed thereof, a sensing assembly for detecting an obstruction on the rail which would inhibit continued and uninterrupted travel of the vehicle, said assembly including a housing mountable on the vehicle, a contact sensor element movable along and parallel to the rail, an elongated flexible cable interconnecting said housing and said sensor element for maintaining said sensor element at a predetermined distance from said housing depending on the speed of the vehicle, reel means rotatably mounted on said housing on which said cable is reeled for varying the length thereof, said reel means being capable of rewinding said cable upon its being slackened, means for propelling said sensor element along the rail for tensioning said cable at said predetermined distance, and said reel means being operatively connected to the speed control mechanism of the vehicle for decelerating vehicle speed to a complete stop if necessary as said cable becomes slackened upon the retardation of the travel thereof as it contacts a rail obstruction.

3,995,561

CONVEYOR STOP MECHANISM

Bernard J. Allor, Jr., Mount Clemens, Mich., assignor to Taylor & Gaskin, Inc., Detroit, Mich.

Filed Apr. 4, 1975, Ser. No. 565,216
Int. Cl.² B61B 13/00; B65G 17/42; B61K 7/00
U.S. Cl. 104—172 S 6 Claims



1. In a conveyor system, the combination comprising:
a main track,
a plurality of carriers movable along said main track,
a conveyor track,
a conveyor movable along said conveyor track,
each of said carriers having a body and a depressable pusher dog with a forwardly facing inclined caming surface,
said conveyor having a pusher lug adapted to engage behind said pusher dog to propel the carriers along the main track,
a hold back dog pivotally mounted on each carrier spaced rearwardly from the pusher dog a distance sufficient to allow forward pivoting of the hold back dog with a pusher lug disposed between the pusher and hold back dogs, means for pivoting the hold back dog forwardly to an inoperative position upon depression of the pusher dog,
a stop member mounted along said conveyor and adapted to be moved into and out of position for engaging and overriding the forwardly facing inclined caming surface of the pusher dog to depress the dog out of engagement with the pusher lug and cause the dog to pass under the stop member,
each carrier body having a stop lug space rearwardly from the pusher and hold back dogs to engage said stop member,
said stop member having a dimension measured longitudinally of the main track exceeding the distance between the pusher dog and the stop lug whereby the stop member will engage the stop lug while continuing to hold the pusher dog depressed,
and said stop lug being spaced rearwardly from the pusher dog a distance exceeding rebound of the carrier upon the stop member engaging the stop lug.

3,995,562

CARGO PALLET LOCK

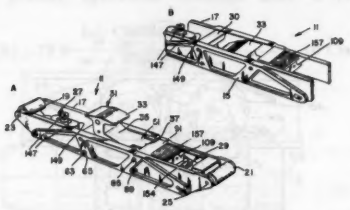
Arnold B. Nordstrom, 3855 Paseo de las Tortugas, Torrance, Calif. 90505

Filed Aug. 18, 1975, Ser. No. 605,668
Int. Cl.² B60P 7/08
U.S. Cl. 105—465 9 Claims

1. A cargo pallet lock for securing a load supporting member in a vehicle having a supporting floor sturcture, comprising:
a pallet restraint member;
a housing structure securable to the floor structure below the load supporting surface thereof and adjacent the load supporting member;
guide means associated with said housing structure and said pallet restraint member for pivotally supporting said pallet restraint member in said housing structure between an elevated position wherein said pallet restraint member extends above said housing structure at least partially into the plane of and lockably engageable with the load sup-

porting member, and a retracted position wherein said pallet restraint member lies below the load supporting member;

bias means mounted in said housing structure and engaging said pallet restraint member for biasing said pallet restraint member toward said elevated position; and



latch-release means mounted in said housing structure and engageable with said pallet restraint member for releasably locking said pallet restraint member in said elevated position and in said retracted position.

3,995,563

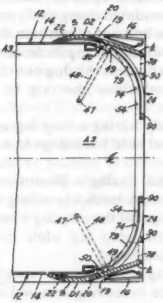
END DOOR FOR RAIL CARS

Donald J. Blunden, Southfield, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Filed May 30, 1975, Ser. No. 582,229

Int. Cl.² B61D *17/06, 19/00*

U.S. Cl. 105—378 **10 Claims**



1. An end closure for a rail car having a side wall, means defining a vertical slot in said side wall near one end of said rail car, said end closure comprising an upright door, said door having a curved laterally outer portion and a planar laterally inner portion, means for guiding said door for lateral movement from a closed position across the end of said rail car to an open position projecting through said vertical slot in which at least a portion of the door is disposed at the outer side of and close to said side wall, said side wall and the adjacent side edge portion of said door in the closed position thereof cooperating to block entry into the rail car, and means for securing said door in its open and closed positions.

3,995,564

LOW LEVEL FLAT CAR

Eugene J. Cordani, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

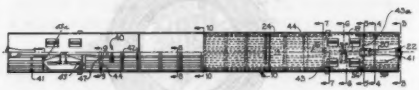
Filed May 29, 1975, Ser. No. 581,839

Int. Cl.² B61F *1/00*

U.S. Cl. 105—418 **20 Claims**

1. A railway flat car comprising:

a center sill extending throughout the length of the car; a deck attached to said center sill; a side sill assembly integrally affixed at opposite sides of the car to the deck; said side sill assembly comprising an upper side sill member adjacent said deck; a depending generally vertical first plate integrally affixed to said upper side sill member; said first plate integrally affixed to cross bearers in the car in the main body of the car and at opposite end portions of the car; said first plate being foreshortened at least in the bolster-truck area of the car; said side sill assembly further comprising on either side of the bolster-truck area and extending through the bolster-truck area of the car, a



second vertical plate transversely spaced from said first plate; at least one cap member integrally affixed to the lower portion of said second plate, whereby the neutral axis of said side sill assembly is located downwardly from said upper side sill member; said cap having a cross section sufficient to carry a significant portion of the longitudinal loads applied to said car through the bolster-truck area; and whereby a significant portion of the longitudinal and vertical loads are transferred from the center sill outwardly to said side sill assemblies on one side of the bolster-truck area and back to the center sill on the other side of the bolster-truck area.

3,995,565

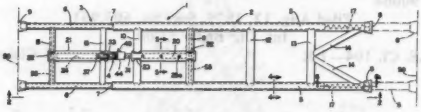
EXTENSIBLE TELESCOPING CARGO BRACE

Henry C. Kersey, 1105 Sixth St. SW., Canton, Ohio 44707

Filed Nov. 13, 1975, Ser. No. 631,728

Int. Cl.² B60P *7/00;* **B61D** *45/00;* **B66F** *3/14;* **E04G** *25/06*

U.S. Cl. 105—497 **10 Claims**



1. Extensible cargo brace construction including

a. a pair of spaced, parallel hollow outer rails having rung means extending transversely therebetween, said outer rails having inner and outer ends;

b. a pair of spaced, parallel inner rails telescopically, slidably mounted with respect to the outer rails and movable between extended and retracted positions, said inner rails having inner and outer ends;

c. rung means extending transversely between the spaced pair of inner rails;

d. spring means operatively connected between the outer and inner rails biasing said inner rails inwardly with respect to the outer rails toward retracted position;

e. lever-actuated jack means mounted on and extending between the rung means of the inner and outer rails for imparting relative movement between said inner and outer rails;

f. the jack means having directional control means movable between retract and expand positions for selectively controlling the direction of movement of the inner and outer rails with respect to each other upon operation of the jack means;

g. the jack means positively moving the outer rails outwardly with respect to the inner rails toward extended position upon actuation of said jack means with the directional control means in expand position; and

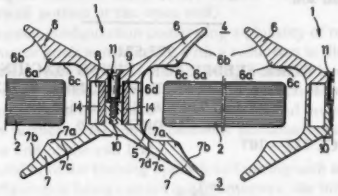
h. The spring means moving the outer rails inwardly with respect to the inner rails toward retracted position upon actuation of the jack means with the directional control means in retract position.

3,995,566

BULLETPROOF BAFFLE ARRANGEMENT

Gustav Lorenz Strobl, Oberbuschweg 225, 5000 Cologne 50, Germany

Filed Sept. 3, 1975, Ser. No. 610,015
Claims priority, application Germany, Sept. 14, 1974, 2444064
Int. Cl.² E06B 7/30
U.S. Cl. 109—21.5 19 Claims



1. A device for positioning in an opening of a bulletproof wall construction permitting communication therethrough while preventing the passage of bullets therethrough, said device comprising:

a. a base portion for positioning in said opening in the plane of said wall construction and spaced from at least one side of said opening, and

b. at least one pair of bullet-deflecting baffles diverging therefrom at an angle of less than 180° relative to each other,

c. the confronting surfaces of said pair of baffles having generally convex configurations and including first portions respectively adjacent said base portion which are substantially parallel to each other and second portions respectively extending at an angle from said first portions such that the distance between the surfaces of said second portions increase with increasing distance from said substantially parallel first portions,

d. whereby, when a bulletproof glass panel is positioned to extend between and be spaced from said confronting surfaces of said pair of baffles such that one edge of said glass panel is spaced from said base portion and between said substantially parallel first portions of said confronting surfaces of said pair of baffles, a speech channel for communication is provided about said one edge of said glass panel and protection is provided against both penetrating shots and ricochets whether the line of fire is oblique to or parallel to said wall construction.

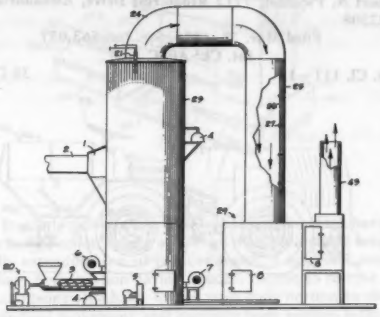
3,995,567

WASTE FUEL INCINERATOR AND POLLUTANT REMOVAL SYSTEM

Dale E. Drake, Concrete, and Jochum G. Kalt, Mount Vernon, both of Wash., assignors to Enertherm, Inc., Mount Vernon, Wash.

Filed June 20, 1975, Ser. No. 588,669
Int. Cl.² F23G 7/00
U.S. Cl. 110—7 R 18 Claims

1. An anti-pollution incinerating system comprising; incinerator means for consuming fuel by combustion, fuel supply means for controllably supplying fuel to said incinerator means, said incinerator means including incinerator outlet means for transmitting heated medium containing the products of said combustion of said fuel from said incinerator means, particle removal means for receiving said heated medium from said incinerator outlet means and for removing particulate therefrom, conduit means connected between said incinerator means and said particle removal means for communicating said medium from said incinerator means to said particle removal means, said particle removal means including medium exhaust means for transmitting clean heated medium from said particle removal means after removal of said particulate from said medium, said incinerator means including a burner vessel having metallic wall means lined with heat energy retaining material means, said incinerator means further including burner means for initiating said combustion and for affecting the temperature of said combustion of said fuel, said



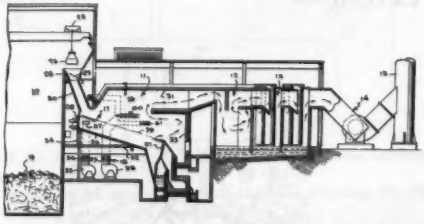
incinerator means further including blower means for supplying combustion supporting fluid to the interior of said vessel, said blower means including a plurality of spaced-apart individually operable blower devices each having an outlet portion disposed interiorly of said vessel, each said outlet portion including a tuyere and said tuyeres being tangentially arranged in said vessel to produce a swirling or cyclonic flow pattern in said combustion on supporting fluid, and further including master control means for concurrently controlling the operation of said fuel supply means, said blower means, said burner means, and said particle removal means.

3,995,568

INCINERATOR AND COMBUSTION AIR SYSTEM THEREFOR

Miro Dvirka, 78 Pond Road, Woodbury, N.Y. 11797, and Keith Stewart, 205 Henry St., Massapequa Park, N.Y. 11762

Filed Nov. 12, 1975, Ser. No. 631,400
Int. Cl.² F23G 5/00; F23L 1/02, 9/02; F23K 5/00
U.S. Cl. 110—8 R 15 Claims



1. A refuse disposal system capable of incinerating heterogeneous refuse said system comprising a combustion chamber, means disposed in the combustion chamber for supporting refuse to be burned, means for charging refuse onto the support means, overfire means for supplying an increasing flow of combustion air above the support means as the temperature of the gaseous products of combustion increases above a first predetermined temperature, underfire means for supplying a

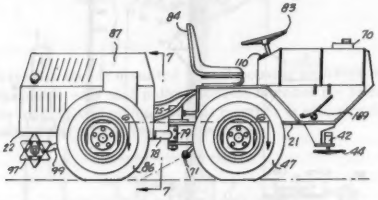
decreasing flow of combustion air below the support means as the temperature of the gaseous products of combustion increases above the first predetermined temperature, and override means for overriding the underfire means to decrease the flow of air under the support means when the temperature of the gaseous products of combustion decreases below a second predetermined temperature.

3,995,569

TWO PART LAWN TREATING MACHINE

Robert N. Picardat, 7712 Ridgecrest Drive, Alexandria, Va. 22308

Filed Mar. 28, 1975, Ser. No. 563,057
Int. Cl.² A01C *7/08*
U.S. Cl. 111—12 **38 Claims**



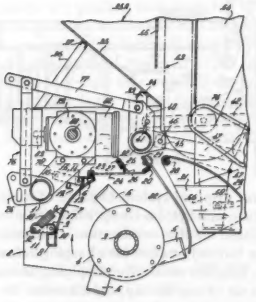
1. A lawn treating machine comprising a front body section having a first pair of ground-engaging supporting wheels, a rear body section having a second pair of ground-engaging supporting wheels, means for driving said ground-engaging supporting wheels, power-generating means mounted on said rear body section, vertical hinge means connecting said body sections, a steering motor connected to said hinge means so as to rotate said sections relative to each other to effect steering of the machine, hopper means mounted on said front section and being provided with a depending bottom discharge conduit means, and motor-driven rotating horizontal scattering disc means mounted on said front section spaced forwardly of said first pair of supporting wheels below said discharge conduit means.

3,995,570

CULTIVATORS

Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Filed Apr. 15, 1975, Ser. No. 568,276
Claims priority, application Netherlands, Apr. 23, 1974, 7405444
Int. Cl.² A01B *33/16, 49/04*
U.S. Cl. 111—85 **15 Claims**



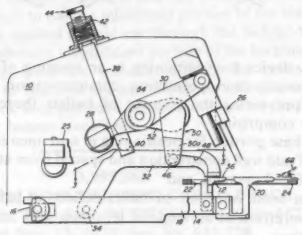
3. A cultivator having a frame supporting a hopper and soil working members rotatably mounted on said frame, driving means connected to said members to move same through the soil, a baffle comprising a screen being located adjacent and to the rear of said members with respect to the normal direction of travel and said screen includng at least one pair of soil guide members that is positioned at the lower portion of said screen, said pair of guide members being positioned adjacent the soil during operation and extending upwardly and outwardly from the soil in substantially V-shaped relationship to one another, said guide members being spaced apart from one another to leave a gap that forms a ridge of worked soil received via said screen, dosing means communicating with said hopper and said dosing means including an outlet located between said guide members above said gap to introduce material in the worked soil.

3,995,571

WORK FEEDER FOR SEWING MACHINE

Robert E. Porter, 5 Oak St., Hamilton, Mass. 01982

Filed Jan. 7, 1976, Ser. No. 646,992
Int. Cl.² D05B *27/06*
U.S. Cl. 112—207 **7 Claims**



1. In a sewing machine having a stitching needle, a lower feed dog for engaging and disengaging the lower surface of material to be sewn to move said lower surface along a predetermined path, a drive system for imparting reciprocating motion to said stitchng needle, drive means for reciprocating said lower feed dog with a motion including a component parallel to said predetermined path, an upper feed dog carried by an arm pivotally linked to said drive means for causing movement of said upper feed dog in synchronism with said lower feed dog, and control means for controlling the movement of said upper feed dog to alternately engage and disengage the upper surface of said material to be sewn to move said upper surface along said predetermined path, the improvement wherein said control means comprise biasing means for biasing said upper feed dog toward said lower feed dog, said biasing means bearing against said arm intermediate said upper feed dog and the location on said arm of said pivotal connection to said drive means, and lifter means responsive to said drive system for periodically moving said upper feed dog in a direction away from said lower feed dog against the force of said biasing means.

3,995,572

FORMING SMALL DIAMETER OPENING FOR AEROSOL, SCREW CAP, OR CROWN CAP BY MULTISTAGE NECKING-IN OF DRAWN OR DRAWN AND IRONED CONTAINER BODY

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed July 22, 1974, Ser. No. 490,277
Int. Cl.² B21D *51/12, 51/24*
U.S. Cl. 113—120 H **5 Claims**

1. Method for reducing the diameter of the sidewall at the open end of a single-piece sheet metal can body comprising providing a seam-free unitary can body having a sidewall

disposed about a longitudinal axis and a unitary endwall at one longitudinal end of the sidewall, the unitary can body sidewall having a peripheral edge defining an open end at the remaining longitudinal end of the sidewall opposite to the unitary endwall,

reducing the diameter of the sidewall contiguous to the open end of the unitary can body by a plurality of die forming operations in excess of two to form a truncated cone configuration portion at the open end of the can body,

the truncated cone configuration portion having a stepped configuration in longitudinal cross section with the total reduction in diameter at the open end of the can body being at least one-third of the original diameter of the sidewall portion at the open end,

the stepped configuration comprising a plurality of reduced diameter gradations starting with a reduction in diameter portion which is of curvilinear configuration in longitudinal cross section and located to form a juncture with the original diameter portion of the sidewall and progressing with further reduction in diameter portions toward the open end of the can body,

the plurality of die forming operations forming such stepped configuration being carried out in sequence, the initial die forming step forming

the curvilinear configuration reduction in diameter juncture at the original diameter portion of the sidewall,

a longitudinally extended cylinder of substantially-uniform reduced diameter corresponding to the reduction in diameter at the curvilinear configuration juncture, and,

an inflection in the sheet metal of the reduced diameter cylinder out of its cylindrical configuration at the open end periphery, such inflection of the sheet metal forming a strengthening rim in such open end peripheral metal, and

each next sequential die forming step being carried out on such reduced diameter cylinder of the next preceding die forming step utilizing die means of reduced diameter characteristics in relation to die means of the next preceding die forming step,

with each separate die means utilizing a loosefitting inner pilot-type die means for maintaining such cylindrical configuration without otherwise supporting the can body internally by maintaining clearance for ease of removal of such pilot-type die means after each reduction in diameter,

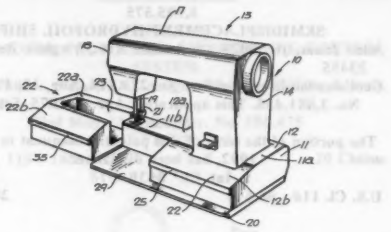
the initial die forming step reducing the diameter a selected percentage of the original diameter with each subsequent percentage reduction in diameter being less than the next preceding previous percentage reduction in diameter.

3,995,573

SEWING MACHINE WITH SLANTED BED PLATE

Teiichi Nishigami, Osaka, and Toshiyuki Hayashi, Amagasaki, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Feb. 17, 1976, Ser. No. 658,183
Int. Cl.² D05B 75/00
U.S. Cl. 112—258 **4 Claims**



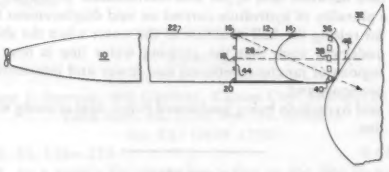
1. In combination, a free arm type sewing machine having a main body portion having a first bed plate including a longitudinally extending arm of reduced width, a separable unitary auxiliary body portion having a recess therein to receive said arm and being attachable to said main body portion by sliding longitudinal movement, said auxiliary body portion including a second bed plate complemental to said first bed plate with corresponding surface portions of said first and second bed plates having corresponding surface contours, each of said first and second bed plates having a forward surface portion which is inclined upwardly from the front edges of the body portion, each inclined surface portion merging into a respective horizontal surface portion on each body portion along a longitudinal line disposed immediately forwardly of the needle bar, the respective inclined and horizontal surface portions of said body portions being substantially coplanar when said body portions are in assembled relation.

3,995,574

DYNAMIC METHOD FOR ENHANCING EFFECTS OF UNDERWATER EXPLOSIONS

Bernard E. Drimmer, 4841 S. 9th St., Arlington, Va. 22204

Filed July 29, 1974, Ser. No. 494,010
Int. Cl.² F42B 19/00
U.S. Cl. 114—20 R **9 Claims**



1. An energy-directing system for a shaped charge comprising, in combination:

a plurality of spaced sensors in the form of a ring, the ring being located in a first plane:

a plurality of spaced detonators in the form of a ring, the ring being located in a second plane which is spaced from the first; the detonators being correspondingly located with the sensors on their respective rings;

a shaped charge having two ends and a concave liner in the shape of a cirboloid at one end, said ring of detonators being located at its other end, the cirboloid end being nearer the sensor ring.

said rings being coaxial and the axis of revolution of said cirboloid being coincident with the axes of said rings; and means connecting said detonators to said sensors for activating said detonators upon the occurrence of a predetermined condition, each sensor being connected to that detonator which is diametricallly opposite it relative to their respective rings.

3,995,575

SEMIDISPLACEMENT HYDROFOIL SHIP

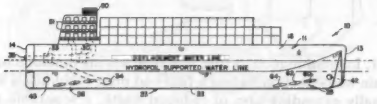
Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Continuation-in-part of Ser. No. 279,714, Aug. 10, 1972, Pat. No. 3,881,438. This application Apr. 9, 1975, Ser. No. 566,353

The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.

Int. Cl.² B63B *1/18*

U.S. Cl. 114—66.5 H **28 Claims**



1. A displacement hull ship, comprising:

a. a deck structure defining a deck;

b. at least one hull structure underlying said deck for supporting said deck above water, said hull structure including a pair of elongated sidewalls extending longitudinally of the ship;

c. each of said sidewalls having an upper portion and a lower portion joined by an intermediate portion;

d. said upper portions extending substantially vertically in regions of their juncture with said intermediate portions;

e. said lower portions depending substantially vertically in regions of their juncture with said intermediate portions and defining opposite sides of a displacement keel which extends longitudinally of the ship;

f. said intermediate portions providing inclined transition surfaces connecting said upper and lower portions;

g. said regions of juncture between said lower and intermediate portions being spaced apart at a majority of locations along the lengths of said side walls by distances which are less than the distances between the regions of juncture between said upper and intermediate portions;

h. said portions being of such configuration as will give the ship a displacement water line near the regions of juncture between said upper and intermediate portions;

i. a plurality of hydrofoils carried on said displacement keel for raising the hull structure in the water when the ship is underway such that the cruising water line is near the regions of juncture between said lower and intermediate portions; and,

1. said hydrofoils being positioned below said cruising water line.

3,995,576

BOAT STEERING ARRANGEMENT PROVIDED WITH AN ANTI-THEFT LOCK

Tore Erik Karl Comstedt, deceased, late of Stockholm, Sweden, and by Magne Ingvar Martinsson, representative, Frolunda, Sweden, assignors to Teknoflex Control System AB, Vastra Frolunda, Sweden

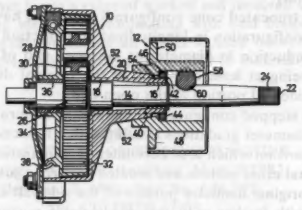
Filed Dec. 10, 1974, Ser. No. 531,363

Claims priority, application Sweden, Dec. 11, 1973, 7316702

Int. Cl.² B63H *25/08*

U.S. Cl. 114—144 R **3 Claims**

1. Boat steering arrangement provided with an anti-theft lock, comprising a steering housing having a rotatably journalled cable wheel for engagement with a steering cable and a rotatably journalled shaft which is drivably connected to the cable wheel, one end of said shaft projecting out of the steering housing and being arranged to support a steering wheel, said steering arrangement also comprising a panel attachment surrounding the shaft, said panel attachment being connected to the steering housing and intended to be attached to a panel, characterized in that the panel attachment is removably con-



nected to the steering housing by means of a nut which is arranged concentric to the shaft, said nut being surrounded by a housing part on the panel attachment and engaging in a threaded portion of a part of the steering housing, said part projecting through a bore in the panel attachment, said housing part supporting a locking arrangement having a lock bolt which, in the locking position, projects into the housing part and engages in a notch in the shaft which is situated on that side of the nut which is facing away from the steering housing.

3,995,577

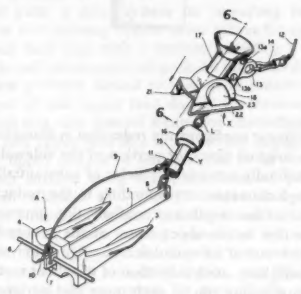
MARINE DEVICE RETRIEVING APPARATUS

Hermond G. Gentry, 2799 Redding Road NW., Atlanta, Ga. 30319

Filed Jan. 16, 1976, Ser. No. 649,855

Int. Cl.² B63B *21/22*

U.S. Cl. 114—206 R **9 Claims**



1. Apparatus for retrieving an ensnared marine device having an elongated shank, a crown end disposed at one end of said shank, a ring end disposed at the other end of said shank and a primary line attached to said ring end and secured to the boat, said apparatus comprising a release element slidably mounted on said primary line adjacent said shank, a release line interconnecting said release element and said crown end for imparting a releasing force thereto, a coupling element slidable along said primary line for engaging said release element in coupled relation and comprising a guiding cavity for controlling the attitude of said coupling element during the sliding movement along said primary line and a coupling cavity, said coupling cavity comprising an entry portion for initially receiving a portion of said release element and a

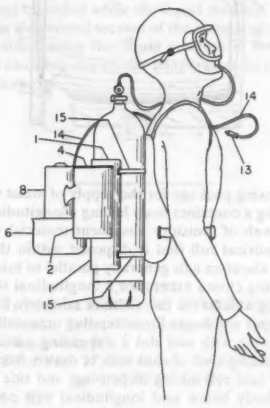
locking portion for preventing release of said coupled relation between said release element and said coupling element, and a lifting line connected to said coupling element.

3,995,578

SCUBA DIVERS PROPULSION UNIT

Keith R. McCullough, 5336 Camelot Drive SW., Olympia, Wash. 98502

Filed Oct. 3, 1975, Ser. No. 610,138
Int. Cl.² B63B 21/00
U.S. Cl. 115—6.1 1 Claim



1. An improved SCUBA divers propulsion unit strapped to an air tank that is in turn strapped to the SCUBA divers back rather than held in front of said diver; and designed to give said diver freedom of his hands for performing other functions; and to eliminate the necessity of setting said unit aside when use of the hands is required for other functions; the said unit comprising:

a one piece unit housing consisting of:

a tank mount of such shape as to conform to the curvature of said air tank;

two power supply housings symmetrically opposite each other secured to either side of said tank mount;

a propeller housing centered between and secured to said power supply housings and secured at the bottom to said tank mount;

a motor housing centered between and secured to said power supply housings by means of two motor housing supports, one of each of said motor housing supports secured at one end to an opposite side of said motor housing with the other end of each said motor housing supports secured to the center of each of said power supply housings;

a power supply made up of eight one and one half volt cells; four of each said cells mounted in each of the two said power supply housings;

two power supply housing covers, one each of said power supply housing covers secured to the front of each of the said power supply housings by means of non corrosive screws to make a water tight seal to protect said power supply cells;

a motor sealed within said motor housing, powered by said power supply;

a propeller secured to and driven by said motor to provide the required thrust to propel said unit and said diver through the water;

a double pole double throw switch mounted on said power supply housing cover and wired in series with said power supply and said motor having a purpose of supplying either 6 volts or 12 volts to said motor depending on the position of said switch;

a motor control either held in the hand of said diver or clipped to said divers tank harness and wired in series with said motor, said power supply, and said double pole double throw switch to energize said motor when propulsion is desired by said diver;

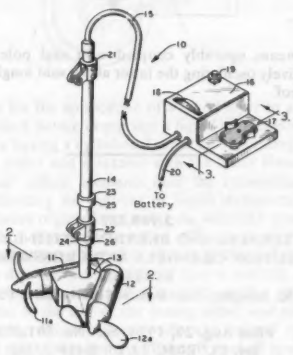
four straps, one each being attached to each of the four corners of said tank mount with the purpose of securing said propulsion unit to said air tank.

3,995,579

DUAL MOTOR PROPULSION AND STEERING CONTROL SYSTEM

Lewis Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.

Filed May 23, 1975, Ser. No. 580,475
Int. Cl.² B63H 21/26
U.S. Cl. 115—18 E 20 Claims



15. In a propulsion and steering control system of the type wherein a pair of reversible electric motors each of which includes a propeller are selectively and independently regulated by control means to produce a forward or reverse thrust therewith, the improvement wherein said control means comprises a switch assembly which includes at least four foot-actuated switches, two of which are operatively connected to a first of said pair of electric motors and which, when respectively activated, selectively produce a forward or reverse thrust with said first motor, and the remaining two of which are likewise operatively connected to the second of said pair of electric motors and which, when respectively activated, selectively produce a forward or reverse thrust with said second motor.

3,995,580

FLAG WAVING DEVICE

Peter J. Serrone, 409 Garfield, Kansas City, Mo. 64124

Filed Mar. 10, 1976, Ser. No. 665,631
Int. Cl.² G09F 17/00
U.S. Cl. 116—173 8 Claims

1. In a device for displaying a flag or the like in waving condition:

base means;

elongate pole means;

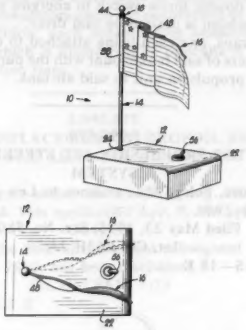
means for mounting said pole means on said base means for rotative movement of said pole means about the longitudinal axis thereof;

flexible flag means to be displayed having a pair of angularly offset edges;

means for securing said flag means to said pole means along one of said edges of said flag means;

elongate support means secured at one extremity thereof to said pole means, extending laterally from said pole

means, and secured to said flag means along the other of said edges of said flag means; and



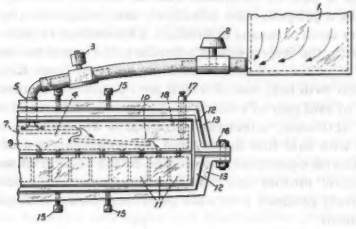
drive means operably coupled with said pole means for rotatively oscillating the latter about said longitudinal axis thereof.

3,995,581

PATTERNING AND BLENDING WITH LATERAL DISTRIBUTION CHANNELS AND CROSSWISE FEEDER SYSTEMS

Richard K. Smejda, P.O. Box 344, Riverside, Paterson, N.J. 07524

Filed Aug. 27, 1974, Ser. No. 501,075
Int. Cl.² B05C *11/10*; B41F *31/02*
U.S. Cl. 118—7 10 Claims



1. A liquid distribution system comprising

a plurality of liquid feeding chambers disposed successively along a horizontal line to apply liquid by gravity to an adjacent passing surface, said chambers including a plurality of vertical partitions separating said chambers into independent liquid feeding units,

a plurality of separate liquid distribution cross channels positioned transversely in a horizontal row over said liquid feeding chambers,

a plurality of liquid supply means supplying different liquids to respective said channels,

a plurality of passageways connecting each said channel to each said chamber, and

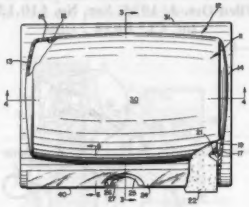
a plurality of detachable resilient liquid control means selectively insertable within said passageways, said control means including solid inserts to selectively block liquid flow and inserts having openings of different sizes to selectively limit liquid flow and permit full flow of liquid through said passageways to control the flow of liquids from said channels into said chambers.

3,995,582

MOIST TISSUE DISPENSING

Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,472
Int. Cl.² B05C *11/02*
U.S. Cl. 118—43 4 Claims



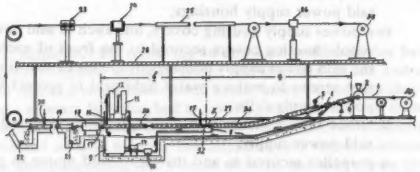
1. A dispensing package for the supply of moist sheet material comprising a container body having a longitudinal axis and enclosing a web of moisture absorbent material wound in a coreless cylindrical roll that is disposed within the body for free rotation about an axis generally parallel to said body axis, said body being closed except for a longitudinal slot in a side wall extending at least the full width of said web, flange means providing upper and lower lips extending outwardly from said slot and defining with said slot a dispensing passage through which the leading end of said web is drawn from the outer periphery of said roll during dispensing, and side wall means within said body below said longitudinal axis providing two similar spaced narrow internal surface areas of bearing support for the opposite ends of said roll and a liquid reservoir space below said roll located longitudinally between said areas, said areas being oppositely inclined to diverge toward the adjacent ends of said body and providing the sole support of said roll within the body, and said space containing liquid at a sufficient level to contact the lower sector of the supported roll.

3,995,583

CONTINUOUS LIQUID CURING SYSTEM FOR THE MANUFACTURE OF INSULATED CONDUCTORS

Michael Stephen Hajagos, deceased, late of Toronto, Canada (by Elizabeth Jean Hajagos, executrix); Robert Zeidenberg, Willowdale, Canada; Edward Frank Davis; Joseph Halasz, both of Toronto, Canada, and Robert Dormany, Guelph, Canada, assignors to Canada Cable and Wire Limited, Toronto, Canada

Division of Ser. No. 296,315, Oct. 10, 1972, Pat. No. 3,903,327. This application Mar. 13, 1975, Ser. No. 558,154
Claims priority, application Canada, Apr. 10, 1972, 139359
Int. Cl.² B05C *11/00*
U.S. Cl. 118—46 12 Claims



1. Apparatus for continuous manufacture of insulated conductors comprising an extruder and an elongated chamber having a first curing section immediately following the extruder and a second cooling section following said first section, both sections being substantially filled with a same liquid

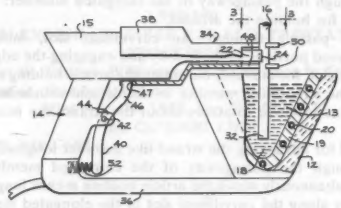
medium which remains liquid under both curing and cooling conditions, means for continuously advancing an electric conductor through said extruder wherein a coat of a curable insulating material is applied thereon and then into and through said chamber filled with the liquid medium, means for maintaining said liquid medium in said chamber under sufficient pressure to produce void free insulation, means for maintaining said liquid medium in the first section of said chamber at a temperature at which said insulating material is cured,said last mentioned means including circulating means for recirculation of the liquid medium in said first section of the elongated chamber while the liquid medium is maintained stationary in the second section of the elongated chamber, and means for maintaining the liquid medium in the second section of said chamber at a cooler temperature to cool the cured insulating material.

3,995,584

PORTABLE ULTRASONIC SOLDERING POT

Michael E. Wendt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 27, 1976, Ser. No. 661,854
Int. Cl.² B05C *3/04*
U.S. Cl. 118—72 4 Claims



1. An ultrasonic hand-held portable tool for coating the end portion of a metal tube member with a layer of metal comprising:

a body member including a tank portion adapted to contain a bath of molten metal for receiving said end portion vertically with the entrance thereto pointing substantially downwardly, and a handle portion arranged on said body member for holding said portable tool when being applied to said end portion to be coated;

heating means disposed on said tank portion for maintaining the metal in said tank in said molten state;

ultrasonic transducer means on said handle portion extending over said tank to a position above the surface of said molten metal and including a tube contacting surface being adapted to direct ultrasonic energy to said tube member when it is positioned in said tank portion;

locating means associated with said transducer means including holding means being manually movable relative to said transducer for positioning said tube member radially in said tank portion in intimate contact with said tube contacting surface;

said manually movable holding means including clamp means arranged diametrically from said tube contacting surface; and

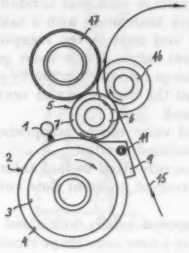
manually operable means on said handle portion being connected to said holding means for articulating said clamp means relative to said contacting surface.

3,995,585

LIQUID APPLICATION-DEVICE

Petrus J. G. Schuurmans, Venlo-West, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed June 17, 1975, Ser. No. 587,538
Claims priority, application Netherlands, June 27, 1974, 7408646
Int. Cl.² B05C *1/08*
U.S. Cl. 118—204 7 Claims



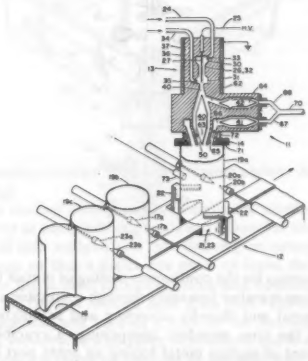
1. Device for the application of a liquid layer to a sheetlike material, which device comprises a liquid application roller, a dosing roller having a cylindrical surface cooperating with said application roller and rotatable with the latter through a nip between said rollers, elements near the extremities of said rollers for limiting the amount of liquid transportable there and one or more organs for pressing the sheetlike material into contact with the application roller, characterized in that said limiting elements are installed at said surface of the dosing roller at the downstream side of and near to said nip, and each of said limiting elements comprises at least five plates lying perpendicular to the axis of the dosing roller, said plates each having an edge thereof closely adjacent to said cylindrical surface and said plates being sufficiently spaced apart to prevent capillary obstruction of liquid transport between them.

3,995,586

COATING APPARATUS

James R. Crose, Chelmsford, and Charles A. Hartnett, Beverly, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 21, 1976, Ser. No. 651,163
Int. Cl.² B05B *13/06*
U.S. Cl. 118—317 8 Claims



1. In apparatus for coating in an open top receptacle comprising:

a nozzle device having a unitary housing including a coating fluid discharge conduit in communication with a supply

of said fluid, a by-pass conduit having an inlet at an upstream portion of said discharge conduit, and a vent conduit having an inlet at the discharge face of said nozzle and communicating with the outlet of said by-pass conduit;

a sealing means disposed at a peripheral portion of the discharge face of said nozzle and encompassing the discharge outlet and said vent inlet and adapted to seat on and seal off said receptacle;

a separate valve means in each said conduit whereby said nozzle in operative association with a said receptable is adapted to vent and coat in the receptacle when the discharge and vent valves are in open position and to by-pass the discharge outlet when the by-pass valve is in open position and the discharge and vent valves are in closed position; and

at least one of said valve means comprising an enlarged section in its associated conduit;

a body member spacedly fixed to said enlarged section to define a predetermined constant flow volume there between;

a piston means disposed axially within sad body member and terminating as a nose cone shape located upstream of said member;

a sleeve means fixed at its respective ends to said body member and said nose cone;

said sleeve being configured so as to flex outwardly to seal said enlarged conduit section when compressed between said fixed body member and movable nose cone; and

actuating means communicated to said body member and piston whereby to effect sealing and opening of said enlarged conduit section.

3,995,587

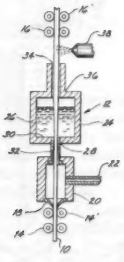
CONTINUOUS CASTING APPARATUS INCLUDING Mo-Ti-Zr ALLOY BUSHING

Marcel V. Carrara, Seymour, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 374,760, June 28, 1973, Pat. No. 3,924,036. This application Sept. 10, 1975, Ser. No. 612,096

Int. Cl.² B05C *3/15*

U.S. Cl. 118—405 **7 Claims**



1. Apparatus for the continuous casting of metals by passing a metal core member upwardly through a crucible containing molten metal and thereby accreting and solidifying molten metal on the core member, comprising: a crucible for the containment of molten metal having an entry port below the surface of said molten metal contents for the passage of a metal core member into the crucible and through the contents thereof, said entry port having positioned therein a bushing member consisting essentially of a molybdenum alloy containing minor amounts of titanium and zirconium.

3,995,588

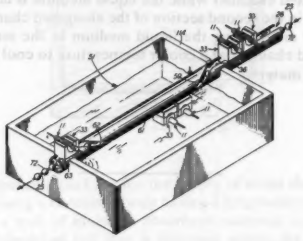
APPARATUS FOR POSITIONING ARTICLES IN A TREATING MEDIUM TO FORM LAYERS OF FUSIBLE METAL THEREON

David L. Booz, Allentown; Ford J. Brown, Kutztown, and Richard J. Merwarth, Easton, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 291,482, Sept. 22, 1972, Pat. No. 3,882,816. This application Mar. 26, 1975, Ser. No. 562,323

Int. Cl.² B05C *3/05, 3/10*

U.S. Cl. 118—426 **5 Claims**



1. Apparatus for positioning articles in a treating medium, comprising:

an elongated member having a curvilinear outer surface, a longitudinally extending passageway, and a curvilinear slot formed in the outer surface of the elongated member and traversing the axis of the passageway, said elongated member being positioned adjacent a means for containing the treating medium; a strand-like member extending through the passageway of the elongated member;

means for holding the articles;

means passing through the curvilinear slot, including grooved portions supported by and engaging the edges of such slot, for movably mounting the article holding means to the strand-like member to enable said article holding means to move rotatably about the strand-like member; and

means for advancing the strand-like member longitudinally through the passageway of the elongated member to simultaneously move the article holding means longitudinally along the curvilinear slot of the elongated member and rotatably about the strand-like member to convey the articles along the elongated member and to position them within the treating medium.

3,995,589

DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

Werner Salger, Hamburg-Langenhorn, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed Mar. 31, 1975, Ser. No. 563,301

Claims priority, application Germany, Apr. 9, 1974, 2417188

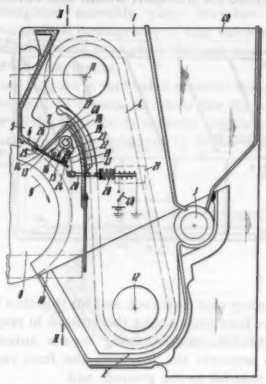
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² G03G *15/08*

U.S. Cl. 118—655 **9 Claims**

1. A developing device for electro-photographic copying machines, comprising a developing powder reservoir, a distribution hopper, a supply of developing powder in the lower region of the developing powder reservoir, said distribution hopper being positioned at a higher level than the developing powder supply, conveyor means to move through the developing powder reservoir and to carry developing powder from the supply to the distribution hopper, means defining a slot-type aperture in the distribution hopper a rotatable image transfer element below the aperture, said aperture extending over at least the axial length of said image transfer element with upper

and lower longitudinal edges lying in a plane inclined at an angle to the horizontal, a plate-type shutter co-operable with the aperture and mounted for sliding movement in order selectively to close and open said aperture, control means coupled to the shutter for effecting movement thereof, sup-



port means arranged between the control means and the shutter, said support means being provided at the side of the lower longitudinal edge of the aperture, said longitudinal edge forming a guide means for the sliding shutter, and the leading edge of the shutter in the closing movement of the shutter moving in an upwards path.

3,995,590

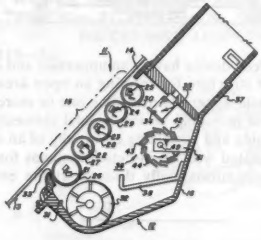
BLENDING CHAMBER FOR ELECTROSTATIC PROCESSORS

Stewart W. Volkers, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,371

Int. Cl.² G03G *15/08*

U.S. Cl. 118—658 **6 Claims**



1. A blender for blending a mixture of flowable materials, said mixture having a predetermined angle of repose; said blender comprising a rotatable chamber having a periphery with a plurality of radially angulated passageways extending therethrough to guide the materials of the mixture into and out of said chamber; the radial angulation of said passageways exceeding the angle of repose of said mixture, said chamber comprising a plurality of generally V-shaped ribs bridged between a pair of opposed end plates at regular angular intervals about said axis of rotation, each of said ribs having one arm anchored to said end plates and another arm freely extending into overlapping spaced relationship with the anchored arm of the next adjacent rib to thereby define said passageways whereby said mixture tends to at least temporarily dwell in said chamber.

3,995,591

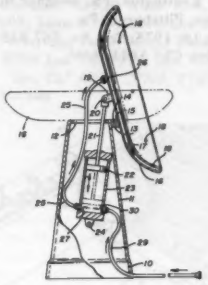
SELF-CLEANING BIRD BATH

Moody Ray Garwood, 781 Kiwana Drive, Youngstown, Ohio 44512

Filed Jan. 28, 1976, Ser. No. 653,210

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **6 Claims**



6. In a bird bath a combination of a vertical stand and a shallow bowl pivoted to the upper end thereof so as to be tiltable relative thereto, an expansible device connected between said vertical stand and said shallow bowl and flexible tubular means establishing communication between the hollow bowl and the expansible device and secondary tubular means communicating with the expansible device for supplying water thereto.

3,995,592

PIGLET WEANING

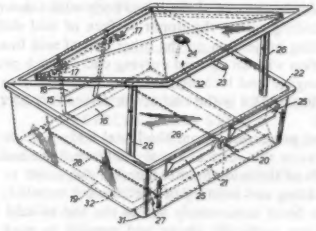
Henry Herbert Goldstaub, Buckhurst Hill, and James Nathaniel Morris, Loughton, both of England, assignors to Electrothermal Engineering Limited, London, England

Filed Apr. 23, 1975, Ser. No. 570,847

Claims priority, application United Kingdom, Apr. 26, 1974, 18499/74

Int. Cl.² A01K *1/00*

U.S. Cl. 119—16 **1 Claim**



1. A housing adapted for use in weaning piglets, the housing comprising:

a. a box molded from glass fiber-reinforced plastics material to form in one piece side walls and a floor for the housing, one of said walls of said box defining an opening therethrough so that a piglet can enter or leave the housing, means for at least partially closing said opening;

b. a lid for the box molded from glass fiber-reinforced plastics material and forming a roof for the housing, said lid being movable to a plurality of positions and in each such position providing an opening to the said box;

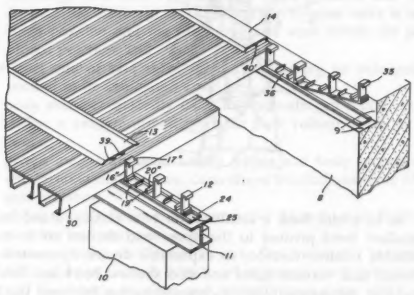
c. means for holding said lid open in each of the said plurality of positions;

d. means carried by said box for ventilating the housing;

e. a feeding hopper carried by said box;

f. a flat electrical heater encapsulated in said floor; and
g. a duct through said floor for carrying water from one side of the housing to another side.

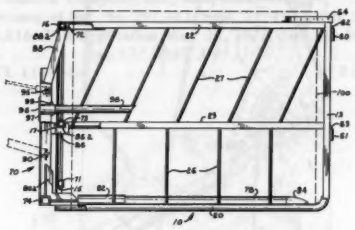
3,995,593
FLOORING SYSTEM
John O. Bowser, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed June 18, 1975, Ser. No. 587,833
Int. Cl.² A01K 1/00
U.S. Cl. 119—28 **9 Claims**



1. A floor structure comprising:
a plurality of downwardly open substantially U-shaped channel members in a parallel spaced apart relation;
spacer means for maintaining the spacing between said channel members arranged transversely of the channel members at two or more locations with each spacer means including
a lineal body portion underlying and transverse to said channel members,
a vertical strut disposed between each pair of adjacent channel members and in contact therewith,
an end structure for coupling the lineal body portion of the spacer means end-to-end with the lineal body portion of an adjacent spacer means comprising a horizontal slot in one end of the lineal body with a downwardly extending rib on the upper surface of said slot, and a locking projection on the other end of said lineal body portion with an upward curving end on such projection to engage and lock against the downwardly extending rib in said slot in the end of the adjacent spacer means, and
upward projections from the lineal body portion thereof between the vertical struts contacting the inside sidewalls of the said channel member thereover to prevent buckling and twisting of the channel member;
retainers fixed transversely across the top of said channel members, vertically above and parallel to each of said spacer means and attached to the spacer means; and
fasteners interconnecting said spacer means and said retainers.

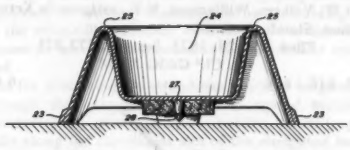
3,995,594
COMBINATION HAY HANDLER AND FEEDER
Wayne A. Rose, Rte. 1, Carrollton, Mo. 64633
Filed Oct. 16, 1975, Ser. No. 622,986
Int. Cl.² A01K 5/00
U.S. Cl. 119—60 **10 Claims**

1. Hay handling apparatus comprising:
a feed rack having a plurality of interconnected panels, said panels including a plurality of bars spaced apart from one another to accommodate the heads of animals therebetween;
a gate structure on said feed rack cooperating with said panels to present an enclosure having a size to accommodate a hay bale therein, said gate structure being movable to provide an opening in said enclosure of a size to receive the hay bale;
a lift operable to supportively receive and raise the hay bale above the ground for transport within said enclosure;



means for coupling said feed rack and lift together to effect raising of the feed rack above the ground in response to raising of the lift, said coupling means automatically releasing to separate the lift from the feed rack upon lowering of said lift to the ground; and
means adapted to hitch said lift to a towing vehicle.

3,995,595
ANIMAL FEED DEVICE CONTAINING AN INSECTICIDAL CARTRIDGE
Robert W. Williams, 429 Cedar St., Lansdale, Pa. 19446
Continuation-in-part of Ser. No. 460,688, April 15, 1974, abandoned. This application Apr. 8, 1975, Ser. No. 566,133
Int. Cl.² A01K 5/00
U.S. Cl. 119—61 **18 Claims**



1. An animal feed device having an upperside and an underside and support structure for forming an open area beneath said underside; said upperside providing one or more receptacles for feed; and including an insecticidal element held beneath the upperside and consisting essentially of an absorbent material impregnated with an insecticide means for emitting insecticidal vapors substantially throughout the entire open area.

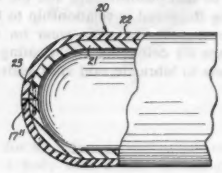
3,995,596
MOUTHPIECE OF ELASTIC MATERIAL FOR A DRINKWATER VALVE FOR CATTLE
Rune Sigvard Andersson, Berchshill, Ossjo 43, S-262 00 Angelholm, Sweden
Filed Dec. 23, 1974, Ser. No. 536,939
Int. Cl.² A01K 7/06
U.S. Cl. 119—71 **7 Claims**

1. A drinking valve for cattle comprising:
a cylindrical valve body having an inlet portion and a discharge portion extending therefrom, an internal throughflow passageway communicating between said portions and an internal valve seat formed in said passageway between said portions; said inlet portion including means for connecting said valve body to a liquid supply;
an elastic mouthpiece comprising an outer wall of a material of low elasticity and an inner wall of a material of substan-

tial elasticity, defining an enclosure, secured to the discharge portion of said valve body and having a closable aperture at the end of said enclosure opposite said valve body, said closable aperture capable of separating said enclosure from the external atmosphere;

an elongated movable valve member received in the through-flow passageway of said valve body and having a portion thereof projecting through said discharge portion into said enclosure;

a sealing ring set in said valve member cooperating with said valve seat to effectively close the through-flow passageway of the valve body thereby separating that portion of the through-flow passageway in the inlet portion of the



valve body from that portion of the through-flow passageway in the discharge portion of the valve body and from the enclosure when said elongated valve member is held in a closed valve position, said elongated valve member capable of being held in a closed valve position solely by the pressure of liquid in the inlet portion of the valve body; the portion of said movable valve member projecting into said enclosure being in a spaced relationship with said elastic mouthpiece;

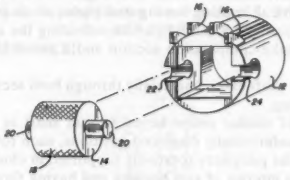
said elongated member capable of being moved into an open valve position by a drinking animal applying sideways pressure through the elastic mouthpiece against the projection portion of said valve member.

3,995,597

FLEA POWDER DISPENSER

Ronald E. Warwick, P.O. Box 1149, Cedar Lake, Ind. 46303

Filed Mar. 31, 1975, Ser. No. 563,309
Int. Cl.² A01K *13/00*
U.S. Cl. 119—86 **4 Claims**



1. In a medicament applicator having a cylindrical housing open at the top and at the bottom thereof, a plurality of teeth formed integrally with the bottom edge portion of the outer cylindrical wall of said housing with the outer ends of said teeth lying in an arcuate curve, said teeth projecting forwardly of said wall and lying substantially parallel to each other and in position on the housing to comb through hair on a hairy surface as the cylinder is moved over said hairy surface with the axis of the cylindrical housing being disposed perpendicular to the plane of said hairy surface, a solid roller having mounting means on each end thereof and being rotatably mounted in the open bottom of the housing with the axis of the roller lying perpendicular to the axis of the teeth on the housing, and a portion of said roller projecting below the plane of the bottom of the housing whereby moving said housing over said hairy surface will rotate the roller to dispense medicament from within said housing onto said hairy surface.

3,995,598

SAFETY COLLAR

Elston A. Gardner, 23920 Anza Ave., No. 127, Torrance, Calif. 90505; Janie G. Connors, and John C. Connors, both of 26833 Westvale, Palos Verdes Peninsula, Calif. 90274

Filed Jan. 15, 1975, Ser. No. 541,290
Int. Cl.² A01K *27/00;* **F16G** *15/00*
U.S. Cl. 119—106 **8 Claims**

1. A safety collar for attachment about an animal's neck, comprising:

a flexible neck member adapted to encircle an animal's neck and having first and second end portions, said first end portion having a first closed ring attached thereto, said second end portion being adapted to extend through said first closed ring;

a second closed ring; and

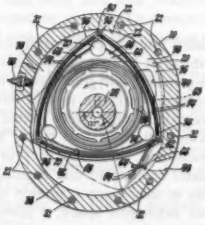
breakaway means including a pair of relatively small diameter closed ring portions coupled together at a point in their respective outer peripheral surfaces by a breakable connecting post portion, said breakaway means being attached between said second end portion and said second closed ring by said ring portions for releasing said second closed ring from said flexible neck member when tension in said breakable connecting post portion exceeding a predetermined magnitude ruptures said post portion.

3,995,599

ROTARY COMBUSTION ENGINE EXHAUST GAS RECIRCULATION SYSTEM

Richard K. Shier, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 31, 1975, Ser. No. 600,619
Int. Cl.² F02B *53/04*
U.S. Cl. 123—8.05 **4 Claims**



1. A rotary combustion engine comprising housing means having an internal peripheral wall and oppositely facing side walls, a rotor rotatably mounted in said housing means with sides facing said side walls and flanks having apexes that

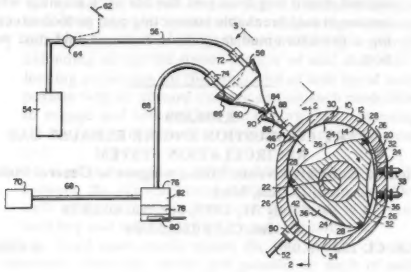
remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively providing a plurality of expansible chambers, an intake port in at least one of said side walls openable by one of said rotor sides to deliver a combustible gaseous mixture to said chambers as they expand in an intake phase, ignition means for igniting the mixture in said chambers following a compression phase whereupon they expand in an expansion phase, an exhaust port openable by said rotor to exhaust said chambers as they contract in an exhaust phase, gas seal means mounted on said rotor sides sealingly engaging the oppositely facing side walls for providing sealing adjacent the flanks of said rotor wherein the gas seal means on said one rotor side passes over said intake port during the opening and closing of said intake port to said chambers, annular oil seal means mounted on said rotor sides radially inward of said gas seal means engaging the oppositely facing side walls wherein the oil seal means on said one rotor side is always radially inward of and never passes over said intake port whereby there is provided a sealed annular space between the gas seal means and oil seal means on said one rotor side that is open to said intake port during the intake phase of said chambers, and exhaust gas recirculation passage means for connecting the trailing region of said chambers to said sealed annular space only when said chambers are nearing the end of the exhaust phase whereby the differential between the pressure of the exhaust gases and the vacuum of the inlet mixture causes exhaust gases in the trailing region of the chambers during the exhaust phase to flow through said sealed annular space to said intake port and thereafter be recirculated through the intake, compression and expansion phases.

3,995,600

HYDROGEN FUELED ROTARY ENGINE

John J. DeLuca, 2903 Dawson Ave., Silver Spring, Md. 20902, and Wayne E. Hughes, 356 Mae Road, Glen Burnie, Md. 21061

Filed June 9, 1975, Ser. No. 585,419
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.13 **10 Claims**



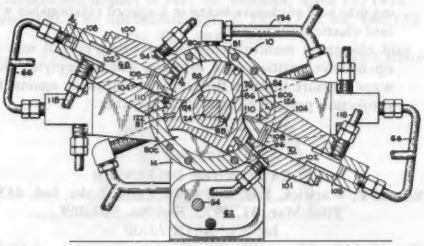
1. A rotary piston internal-combustion engine adapted to operate on a combustible hydrogen fuel gas mixture, comprising: engine housing means; polygonal piston means within said housing means rotatable relative to said housing means and cooperating therewith to effectively define therebetween a plurality of working chambers that rotate about the axis of said housing means and cyclically vary in volume as said piston means rotates relative to said housing means so as to effectively provide in succession a suction space, a compression space and an expansion space; a plurality of apex seal means connected to and circumferentially spaced around the periphery of said piston means and in sliding engagement with said housing means; hydrogen fuel gas mixture inlet passage means extending through the wall of said housing means into said suction space and comprising a plurality of intake ports spaced along a line extending substantially across the width of said housing means transverse to the direction of rotation of said piston means; hydrogen fuel gas mixture supply means for supplying said combustible hydrogen fuel gas mixture from a hydrogen fuel gas mixture source to said hydrogen fuel gas mixture inlet passage means, said hydrogen fuel gas mixture supply means terminating in hydrogen fuel gas mixture intake header means on the outer surface of said housing means covering all of said intake ports for distributing said hydrogen fuel gas mixture to each of said intake ports; exhaust gas outlet passage means extending through the wall of said housing means from said expansion space comprising a plurality of exhaust ports spaced along a line extending substantially across the width of said housing means transverse to the direction of rotation of said piston means and the line of said exhaust ports being staggered in relationship to the line of said intake ports for maintaining even wear on said apex seal means; and means for delivering a lubricating fluid into said working chambers to lubricate said apex seals.

3,995,601

ROTARY INTERNAL COMBUSTION ENGINE

Everett C. Schwartz, 7233 Mesa Drive, Aptos, Calif. 95003

Filed Jan. 13, 1975, Ser. No. 540,526
Int. Cl.² F02B *53/08*
U.S. Cl. 123—8.41 **5 Claims**



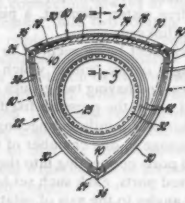
5. A rotary internal combustion engine which comprises
a cylindrical housing having end plates at its opposite extremities and a central partition dividing the interior into an intake-compression section and a power-exhaust section,
a power shaft extending axially through both sections of said housing,
a pair of similar rotors keyed to said shaft at axially and circumferentially displaced positions, each rotor having a circular periphery rotatively supported in close proximity to the interior of said housing and having three peripherally recessed portions forming three working chambers at 120° angular intervals.
valves extending substantially radially through said housing into contact with said rotor peripheries at angular intervals of 180° in both sections of said housing,
means for resiliently urging said valves against said rotor peripheries,
intake ports through said housing into said intake-compression section at 180° angular intervals,
exhaust ports through said housing into said power-exhaust section at 180° angular intervals,
a pair of transfer ports through said central partition at 180° angular intervals, and
means for sequentially igniting a fuel-air mixture in the chambers in said power exhaust sections at two positions having an angular spacing of 180° therebetween.

3,995,602

HIGH COMBUSTION SURFACE TEMPERATURE ROTOR FOR AN INTERNAL COMBUSTION ROTARY ENGINE

Harvey A. Burley, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1975, Ser. No. 608,005
Int. Cl.² F02B 53/04
U.S. Cl. 123—8.45 2 Claims



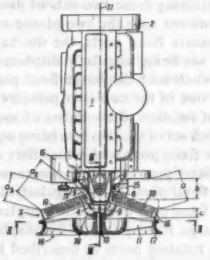
1. A rotor for an internal combustion rotary engine, said rotor having a body with axially spaced radially extending sides and radially outwardly facing flanks, and hot plate means sealingly secured to the flanks and spanning at least substantial portions thereof to form substantial portions of moving combustion chambers, said hot plate means being movable radially inwardly in response to increased temperature so as to seat against said rotor body in increased heat conducting relationship, the radial movement in relation to said rotor body being such that said hot plate means are normally separated by sealed air spaces from said rotor body so as to be insulated therefrom and thereby retain a substantial portion of the heat of combustion and on hot plate temperature rise with engine speed and load to a temperature below that which would cause pre-ignition moving to seat against the rotor body to thereby limit hot plate temperature to below the pre-ignition temperature.

3,995,603

COOLER-CUM-BLOWER ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

Gerhard Thien; Heinz Fachbach, and Josef Greier, all of Graz, Austria, assignors to Hans List, Graz, Austria

Division of Ser. No. 507,525, Sept. 19, 1974. This application Feb. 20, 1976, Ser. No. 659,964
Claims priority, application Austria, Apr. 8, 1974, 2934/74
Int. Cl.² F01P 3/20
U.S. Cl. 123—41.51 3 Claims



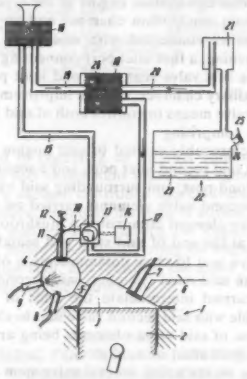
1. A cooler-cum-blower assembly for internal combustion engines surrounded by an encasing, with an interspace between the encasing and the outer surface of the engine through which cooling-air flows, comprising a water-cooler including two upright cooler elements located in front of a front end of the internal combustion engine opposite each other in relation to a longitudinal median plane of the engine, each of the cooler elements forming an acute angle with said longitudinal median plane on the side facing away from the engine, an axial blower actuated by the engine and arranged in front of the two cooler elements, said axial blower comprising a blower shaft, a blower impeller mounted thereon, and an outer ring encompassing the blower impeller, further comprising a central bracket attached to said front-end of the engine, a bearing for the blower shaft located on the central bracket, an intermediate housing attached to said central bracket and extending from the cooler elements as far as the axial blower, said intermediate housing closing the space between the cooler elements and the blower in an upward and downward direction and comprising a flange on its side facing away from the engine, said outer ring of the blower being attached to said flange, and a connecting cooling-air shaft extending from the said intermediate housing as far as the interspace between the encasing and the outer surface of the internal combustion engine.

3,995,604

SPARK IGNITED INTERNAL COMBUSTION ENGINE OPERATED WITH CHARGE STRATIFICATION

Walter Brandstetter, Gifhorn, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 25, 1975, Ser. No. 553,034
Claims priority, application Germany, Mar. 7, 1974, 2410803
Int. Cl.² F02B 19/10, 19/18
U.S. Cl. 123—75 B 7 Claims



1. A spark ignited internal combustion engine operated with charge stratification, comprising, in combination:

a main combustion chamber and an auxiliary combustion chamber, said main and said auxiliary chambers being interconnected by means of a connecting passage;

a closed fuel system having filter means for adsorbing gaseous components;

means, connected to said fuel system, for supplying fuel to said main chamber;

means, connected to said fuel system, for supplying fuel to said auxiliary chamber and providing a combustable fuel-air-mixture in said auxiliary chamber, said fuel-air-mixture being richer than the fuel-air-mixture in said main chamber;

means for igniting the fuel-air-mixture in said auxiliary chamber; and

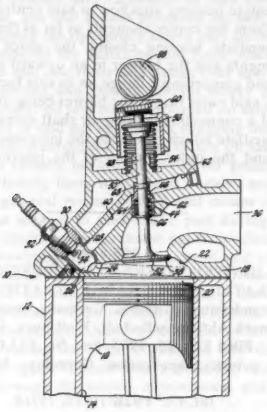
an auxiliary intake line opening into said auxiliary chamber and connected with said filter means such that said filter means operates in the desorption direction as gases are drawn into said auxiliary chamber from said filter means.

3,995,605

JET IGNITION ENGINE WITH SINGLY ACTUATED DUAL INLET VALVES

Ming-Chih Yew, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,779
Int. Cl.² F02B *19/00*
U.S. Cl. 123—75 B **3 Claims**



1. An internal combustion engine of the type having means defining a main combustion chamber and an auxiliary combustion chamber connected with said main chamber by a restricted opening, a first inlet port connecting with said main chamber at a first valve seat, a second inlet port connecting with said auxiliary chamber, and the improvement comprising dual intake valve means to control both of said inlet ports, said valve means comprising

a stem reciprocably carried in said engine and extending through said second inlet port, and a second valve seat in said second port, and surrounding said valve stem,

first and second valve elements carried on said stem, said first valve element comprising a mushroom shaped head carried at the end of said stem and seatable against said first valve seat to close communication of said first inlet port with said main chamber, said second valve element being carried intermediate the ends of said stem and engagable with said second valve seat to close said second port, one of said valve elements being arranged for limited reciprocation on said stem,

first spring means acting on said valve stem and urging said stem in direction to close said valve elements,

second spring means acting between said stem and said one valve element and urging said one valve element toward a position wherein it will be seated in advance of the other of said valve elements upon closing movement of said stem, said second spring means being yieldable upon seating of said one valve element to permit continued closing motion of said valve stem until seating of said other valve element, and

actuating means engageable with said valve stem for opening said valve elements.

3,995,606

GASOLINE ENGINE TORQUE REGULATOR WITH SPEED CORRECTION

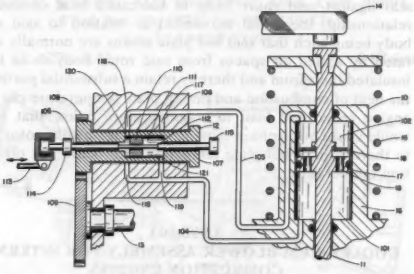
Joseph Carl Firey, 1554 N.E. 95th St., Seattle, Wash. 98115

Filed Feb. 2, 1976, Ser. No. 654,572
Int. Cl.³ F01L *9/02*
U.S. Cl. 123—90.12 **4 Claims**

1. The combination of a four stroke cycle gasoline engine, complete with engine intake valves, intake valve closing springs, intake valve operating cams and linkage, and additionally fitted with a dashpot connecting between each such engine intake valve and the frame of the engine, wherein the improvement comprises connecting the two chambers of each such dashpot together via a variable stroke, positive displacement flow regulator;

said variable stroke, positive displacement, flow regulator comprising a fixed port element, a rotating port element and drive, a free piston element, a piston stop bar and torque control linkage;

said fixed port element being secured to the engine frame and containing a cavity, within which the rotating port element rotates, and having two groups of fixed ports; one group of fixed ports, the pressure fixed ports, being connected together and jointly connecting via a portion of the control passage to one chamber of the dashpot, these pressure fixed ports connecting into the cavity in two sets of pressure fixed ports, each such set being coplanar in a plane at right angles to the axis of rotation of the rotating port element, the plane containing the one set of pressure fixed ports being displaced axially along said axis of rotation from the plane containing the other set of pressure fixed ports by a distance sufficient for sealing therebetween, the pressure fixed ports of each such set being angularly displaced relative to each other about said axis of rotation, the number of such pressure fixed ports in each set of the two sets being an integral odd number; the



other group of fixed ports, the discharge fixed ports, being connected together and jointly connecting via the other portion of the control passage to the opposite chamber of the dashpot, these discharge fixed ports connecting into the cavity in two sets of discharge fixed ports, each such set being coplanar in a plane at right angles to the axis of rotation of the rotating port element, these two planes containing these two sets of discharge fixed ports being coincident with the two planes containing the two sets of pressure fixed ports, the discharge fixed ports of each such set being angularly displaced relative to each other and each such discharge fixed port being displaced 180° from one of the coplanar pressure fixed ports about said axis of rotation, the number of such discharge fixed ports in each set of the two sets being equal to the number of pressure fixed ports with which they are coplanar, each pressure fixed port of one coplanar set of pressure and discharge fixed ports being angularly displaced from one discharge fixed port of the other coplanar set of pressure and discharge fixed ports by the displacement angle between the rotating ports as described hereinafter;

said rotating port element being positively rotated, within the cavity in the fixed port element, as by gears or chains, from an engine shaft such as the crankshaft or camshaft, said rotating port element being closely and sealably fitted to the cavity in the fixed port element; said rotating port element being fitted with two passages, each such passage being fitted with two ports at its ends, one such

port of one such passage indexing with and being always coplanar with one set of coplanar pressure and discharge fixed ports in the fixed port element the other port of this same passage connecting always to one end of the free piston element as described hereinafter, one such port of the other passage indexing with and being always coplanar with the other set of coplanar pressure and discharge fixed ports in the fixed port element the other port of this latter passage connecting always to the other end of the free piston element, said two rotating ports which index with and are coplanar with the pressure and discharge fixed ports being angularly displaced from one another about the axis of rotation of the rotating port element by the displacement angle which can have any value between zero and 180°; said rotating port element being axially held in alignment within the cavity in the fixed port element so that the rotating ports index with and remain coplanar with the sets of pressure fixed ports and discharge fixed ports;

said free piston element being a free piston and closed ended cylinder with the free piston fitted closely and moveably within the cylinder and being free to move within said cylinder except as limited by the piston stop bar, one end of said cylinder connecting always into one passage in the rotating port element and the other end of said cylinder connecting always into the other passage in the rotating port element, the closed ends of said cylinder being fitted with holes for the piston stop bar and these two stop bar holes are straight and parallel to the axis of the cylinder;

said piston stop bar comprising two portions fitted closely, sealably and moveably into the two holes in the closed ends of the cylinder of the free piston element and both portions being of equal cross sectional area less than the cross sectional area of the cylinder, these two portions of the piston stop bar being connected positively together so as to move together, at least one such portion being moveable into the cylinder of the free piston element and to thus limit the motion of the free piston within this cylinder, said piston stop bar being fitted with two control stops which limit the range of motion of the piston stop bar, one of these control stops the full control stop is placed on the piston stop bar so that when the piston stop bar is against this full control stop the free piston is free to move through its full displacement volume in each direction before being stopped by the cylinder end or the piston stop bar, the other control stop the idle control stop is placed on the piston stop bar so that when the piston stop bar is against this idle control stop one portion of the piston stop bar extends into the cylinder a distance which will produce a free piston active displacement volume equal to the idle displacement volume as defined hereinafter, said piston stop bar being moveable to any position between the two positions set by the two control stops via a torque control linkage connected to said piston stop bar;

the displacement volume of one full stroke of the dashpot, VD, the displacement volume of one full stroke of the free piston, VP, the total number of pressure fixed ports in the fixed port element, n, the revolutions per minute of the rotating port element, NR, the revolutions per minute of the engine, NE, are necessarily related to one another and to the minimum intake valve closing angle, AM, in crankshaft radians, according to the following equations:

$$(VP)(n)(NR/NE)(AM) = (6.283)(VD)$$

wherein the speed ratio, NR/NE, is determined by the positive drive mechanism driving the rotating port element from the engine shaft, the minimum intake valve closing angle, AM, is at least as small as the intake valve closing angle in crankshaft radians of the intake cams on the engine camshaft, AC, and is preferably less than AC up to as small as one half of AC; the idle displacement volume of one active stroke of the free piston, VI, is determined by the following equation:

$$VI = (VP)\left(\frac{AM}{AX}\right)$$

wherein the maximum intake valve closing angle, AX, is equal to the minimum intake valve closing angle, AM, plus 3 radians minus the maximum engine ignition spark advance in crankshaft radians before piston top dead center;

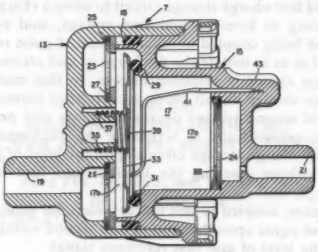
on multicylinder gasoline engines the several piston stop bars of the several variable stroke, positive displacement, flow regulators being connected to the torque control linkage with equal free piston stroke length.

3,995,607

VACUUM RETARD DELAY VALVE

George Ludwig, Troy, and William J. Walters, Milford, both of Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed Apr. 14, 1975, Ser. No. 567,582
Int. Cl.² F02P 5/00
U.S. Cl. 123—117 A **11 Claims**



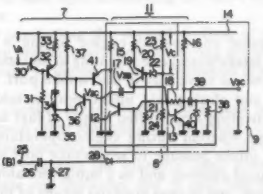
1. A method of operating an internal combustion engine with decreased fuel enrichment when the engine is cold, the engine having a vacuum controlled spark advance connected to a vacuum source, including the steps of advancing the spark in the normal manner upon starting the engine when cold, delaying spark retard upon accelerating the engine when cold to prevent engine stall, and retarding the spark in the normal manner after the engine warms up.

3,995,608

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Seiji Suda, Mito, Japan, assignor to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of, Japan

Filed June 18, 1974, Ser. No. 480,473
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 E **7 Claims**



1. An ignition timing control system for an internal combustion engine comprising, in combination:

first means for generating a first pulse reference signal in synchronism with the rotation of the engine;

second means for generating an advance angle control signal representative of the operating condition of the engine;

third means, coupled to said first and second means, for generating a first voltage, the amplitude of which is proportional to the lapse of time from the generation of the first pulse reference signal from said first means, and including a first charge storage circuit, and a first constant current circuit connected thereto for supplying a constant charging current to said first charge storage circuit in accordance with the advance angle control signal from said second means, the charge stored by said first charge storage circuit corresponding to said first voltage;

fourth means, coupled to said first and third means, for generating a second voltage, the amplitude of which decreases along a prescribed linear gradient from the level of said first voltage toward a first reference voltage in response to the receipt of a first pulse reference signal from said first means, and including a first switching circuit and a second charge storage circuit coupled thereto, said second charge storage circuit being coupled to said first charge storage circuit to store a charge corresponding to level of said first voltage, said switching circuit being coupled to receive said first pulse reference signal so as to initiate the discharge of said second charge storage circuit in response thereto, so that said second charge storage circuit produces a voltage corresponding to said second voltage decreasing along said prescribed linear gradient and to terminate the discharge of said second charge storage circuit upon the level of said second voltage reaching the level of said first reference voltage; and

fifth means, coupled to said fourth means, for generating an output signal upon the level of said second voltage reaching the level of said first reference signal.

3,995,609

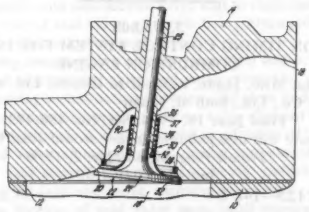
INTERNAL COMBUSTION ENGINE FUEL CONTROL ARRANGEMENT

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 570,249

Int. Cl.² F01L 3/00

U.S. Cl. 123—188 S **3 Claims**



1. An internal combustion engine having a combustion chamber, an intake passage terminating at an intake port open to said chamber, a valve seat in said intake port, valve means for opening and closing said intake port at said valve seat, means for delivering a controlled supply of fuel and air to said intake passage wherein during engine operation fuel passes through said intake passage to said intake port as a vapor, as suspended liquid droplets and as a liquid film along the intake passage surface, and porous material means of predetermined porosity throughout arranged in and about said intake passage adjacent to and upstream of said valve seat for intercepting the liquid film adjacent the upstream side of said valve seat and accumulating this fuel on reduced air flow and releasing the accumulated fuel to said intake port on increased air flow while distributing the accumulated fuel about said intake port.

3,995,610

FOUR CYLINDER STRAIGHT-TYPE ENGINE WITH SECONDARY BALANCER SYSTEM

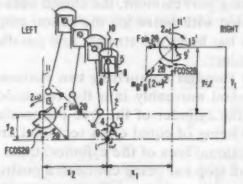
Hirokazu Nakamura; Mitsutaka Kinoshita, both of Kyoto; Tadahiko Ito, Nagaokakyo, and Kazumasa Kawata, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,780

Claims priority, application Japan, Nov. 27, 1973, 48-133873; Apr. 5, 1974, 49-38665

Int. Cl.² F22B 5/00

U.S. Cl. 123—192 B **14 Claims**



1. In a mechanism of the type wherein at least one piston reciprocates along a longitudinal axis of at least one cylinder, said at least one piston being connected to a rotatable crankshaft via a connecting rod, the improved vibration dampening system comprising:

a. at least one pair of balancer elements rotatably supported on said mechanism, an upper balancer element of each pair being disposed laterally of an upper portion of said mechanism and a lower balancer element of each pair being disposed laterally of a lower portion of said mechanism such that the balancer elements are located on opposite sides of the cylinder and the axes of rotation of the balancer elements are parallel to the axis of rotation of the crankshaft and are located in a first plane which is disposed obliquely to a second plane containing the longitudinal axis of said cylinder and the axis of rotation of said crankshaft wherein the difference between the distance of said upper and lower balancer elements from said second plane is in the range of $-0.5l \leq X_2 - X_1 \leq +0.5l$ where:

l = length of the connecting rod;

X_2 = distance between the lower balancer element and said second plane; and

X_1 = distance between the upper balancer element and said second plane,

and wherein the distance between the axes of rotation of the balancer elements measured in a direction parallel to the second plane is in the range of from 15% to 135% of the length between the connecting points of the connecting rod between the piston and the crankshaft; and

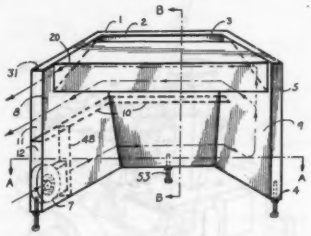
b. means driven by said mechanism to rotate said upper and lower balancer elements in opposite directions at twice the angular velocity of the crankshaft such that said lower balancer element is rotated in a direction opposite that of the crankshaft.

3,995,611

FIREPLACE HEATING CHANNEL

Clifford H. Nelson, 9 Merry Point Terrace, Newport News, Va. 23606

Filed Dec. 18, 1975, Ser. No. 641,725
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.² F24B 7/04
U.S. Cl. 126—121 7 Claims



1. A free standing fireplace heating channel comprising a hollow metal air conveying channel in combination with a flame guide vane, insertible into an existing conventional fireplace without requiring modification to the fireplace structure, said channel having a center panel and at least one forward facing channel arm adapted to fit against multiple inside walls of a fireplace, said channel having adjoining walls exposed to the heat from the fire with corresponding rear walls spaced therefrom and connected by spacer means so as to form a suitable air channel for conveying room air to be heated by the fire, means for forcing room air into a lower portion of said forward facing channel arm by a single blower located therein, and baffle means to direct the forced circulating room air to make multiple horizontal passes through said channel prior to exiting back into a room from an upper portion of a forward facing channel arm as useful heating air, said flame guide vane being attached to an upper inside portion of said forward facing arm of said air channel and extending horizontally to a symmetrical position on an opposite side, said flame guide vane having a triangular cross-section with the base horizontal and the apex pointing downward toward the fire and positioned forward of the center panel of the air channel so as to form an upward converging passageway for the hot fire gases, said passageway being formed by the upper portion of a near vertical surface of the center panel and the opposing rearward slanting surface of the flame guide vane wherein the width of the horizontal base of the guide vane is constructed wide enough to extend to the fireplace front such that by means of the vertically adjustable legs the said horizontal base can be brought in contact with the existing fireplace arch to block off the flow of excess room air.

3,995,612

CORNER ASSEMBLY FOR FIREPLACE ENCLOSURE

Robert C. Dew, New Albany, Ind., assignor to Stratton & Terstegge Co., Inc., New Albany, Ind.

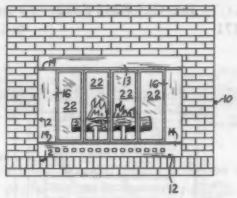
Filed June 10, 1975, Ser. No. 585,474
Int. Cl.² F24C 15/04
U.S. Cl. 126—139 5 Claims

1. In a fireplace enclosure disposed to surround a fireplace outwardly of the opening therefor and having horizontal top and bottom panels and vertical side panels, the improvement comprising:

a. a plate-like corner bracket extending alongside end portions of adjacent horizontal and vertical panels,

b. at least one laterally offset tab-like member carried by an edge of said plate-like corner bracket and there being a passageway through an end portion of one of said adjacent panels in position to receive said tab-like member whereby said corner bracket is secured to said one of said adjacent panels,

c. additional means securing said plate-like corner bracket to said end portion of the other of said adjacent panels so that said end portions of adjacent panels are secured to each other, and



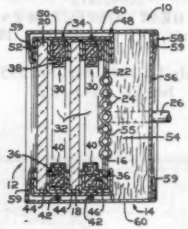
d. an adjustable retaining member carried by said plate-like corner bracket and having an adjustable projecting member disposed to engage an inner portion of the fireplace opening.

3,995,613

SOLAR HEAT COLLECTOR UNIT

Pandit G. Patil, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 18, 1975, Ser. No. 550,507
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 8 Claims



1. In combination with a solar heat collector of the type having a cover plate for passing solar energy mounted in spaced relation to a solar energy absorber to provide an airspace therebetween, the peripheral edges and outer marginal edges of the cover plate and absorber define a subassembly, comprising:

a layer of thermal insulating material having a first surface and a second surface opposite to the first surface, the first surface of said layer contacting the outer surface of the absorber;

a member contacting the second surface of said thermal insulating material said member having peripheral dimensions similar to the peripheral dimensions of the absorber; and

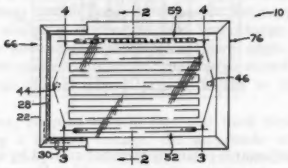
U-shaped channel means having outer legs spring biased toward each other mounting the peripheral edge portions of said subassembly and said member with a one of the outer legs engaging the marginal edge portions of said cover plate and the other one of said legs engaging the outer marginal edge portions of said member for urging the subassembly and said member together about said layer of thermal insulating material.

3,995,614

SOLAR HEAT COLLECTOR

Orlando J. Cerra, New Kensington, and Pandit G. Patil, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 19, 1975, Ser. No. 559,956
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 15 Claims



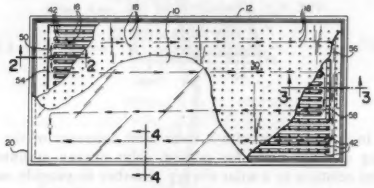
1. A solar heat collector comprising:
a monolithic pan-shaped solar energy absorber having a base and sidewalls;
a cover plate capable of passing solar energy supported by said sidewalls of said absorber in spaced relation to said base of said absorber to provide an airspace therebetween;
a moisture-impervious adhesive mounting said cover plate and said absorber to prevent moisture from moving into the air space; and
moisture-absorbing means mounted in said absorber and communicating with the air space to absorb moisture in the air space.

3,995,615

SOLAR HEAT COLLECTOR PANEL

Edward J. Hojnowski, 112 Lagana Ave., Plantsville, Conn. 06479

Filed July 11, 1975, Ser. No. 595,372
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 17 Claims



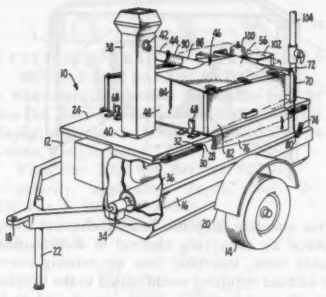
1. A solar heat collector panel comprising:
a. a base defining an upwardly open cavity with a floor,
b. a cover for closing said base cavity to allow evacuating of said cavity,
c. a flat heat collector plate in said base cavity and spaced downwardly below the underside of said cover,
d. means defining longitudinally extending fluid passageways in said plate,
e. means supporting said plate including at least one plate support member mounted in said base, and a member adapted to cooperate with said plate support member and carried by the underside of said collector plate, one of said members being made from a gas sorptive material, the other of said members engaging said gas sorptive member to abrade it in response to movement of said collector plate relative to said base due to thermal expansion and contraction of said plate caused by variations in the incident solar energy.

3,995,616

ASPHALT KETTLE AND CLOSURE THEREFOR

William P. Schrader, Mill Valley, Calif., assignor to Cleasby Mfg. Co., Inc., San Francisco, Calif.

Filed Mar. 17, 1975, Ser. No. 558,663
Int. Cl.² E01C 19/45
U.S. Cl. 126—343.5 A 9 Claims



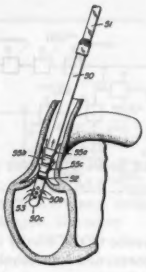
1. An asphalt kettle comprising, in combination:
a kettle chamber having heating means therein to melt asphalt contained within the chamber, said chamber having an open top portion;
a closure disposed over the chamber, said closure having opposed spaced vertically extensive side walls, each of which side walls has at least one opening therein of sufficient size to permit bulk chunks of asphalt to be loaded therethrough into the chamber, end walls spanning the space between the side walls and a top extending between said side and end walls;
a chute portion fixed relative to each opening and extending inwardly therefrom, each such chute portion being peripherally sealed around the opening from which it extends and having inner edges defining an inwardly and downwardly sloping plane;
a door hingedly secured above each of said chute portions, said doors being dimensioned for abutting engagement with the edges of the chute portions whereby the doors seal against said edges in the event the pressure to the interior of the closure exceeds that to the exterior thereof;
means securing the closure to the kettle for movement between a first position wherein the closure effectively seals the kettle chamber around the open top portion thereof and a second position at least partially elevated relative to the chamber wherein gas may escape therearound, said means permitting movement of the closure to the second position responsive to pressure within the chamber in the event of an explosion therein;
a skirt fixed to the closure and extending downwardly around the kettle chamber, said skirt being of a length sufficient to extend around the chamber when the closure is in the second position; and,
stop means to limit the extent to which the closure can open in the event of an explosion within the chamber to an extent such that when the closure opens to the second position in response to an explosion within the chamber all gas and debris exiting around the closure is deflected downwardly by the skirt.

3,995,617

HEART ASSIST METHOD AND CATHETER

David H. Watkins, 6039 N. Waterbury Road, Des Moines, Iowa 50312, and Erwin J. Klink, 814 Laurel Circle SE., Albuquerque, N. Mex. 87108

Filed May 31, 1972, Ser. No. 258,272
Int. Cl.² A61M *1/03*
U.S. Cl. 128—1 D 9 Claims



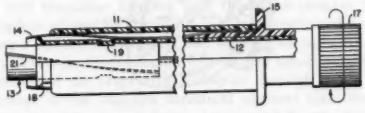
1. Method for augmenting the action of an ailing heart having a left ventricle and associated aorta wherein an open-ended catheter, with further opening back from said open end, is inserted into the aorta with open end within the left ventricle and said further opening outside of the same, comprising in sequential operation sucking blood from said left ventricle by way of the open end of said catheter during systolic pulsation, while blocking a back-flow of blood from said associated aorta; and during reverse cycle, or diastolic pulsation, forcing blood back through said catheter and into the aorta by way of said further opening while blocking a flow back into the said left ventricle.

3,995,618

CERVICAL TISSUE CELL-GATHERING DEVICE

Warren K. Kingsley, Bethlehem, Pa., and Stanley Schoenfeld, Pound Ridge, N.Y., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed June 16, 1975, Ser. No. 587,160
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 B 6 Claims



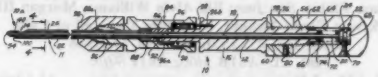
1. A cervical tissue cell-gathering device comprising:
an outer tube;
an inner tube, slightly longer than said outer tube, telescopically positioned within said outer tube and longitudinally movable therein;
a moistened cervical sponge mounted at the forward end of and projecting from said inner tube, said sponge moistened with a fixative solution for preserving cervical tissue cells; and
a thin, flexible, mucous-protecting sleeve which encloses said inner tube and said cervical sponge before and during insertion into the vagina, one end of said sleeve being fastened to the inner wall of said outer tube, and the other end of said sleeve being folded over the forward end of said sponge in such a manner as to permit said cervical sponge to be extended therethrough.

3,995,619

COMBINATION SUBCUTANEOUS SUTURE REMOVER, BIOPSY SAMPLER AND SYRINGE

Stephen G. Glatzer, 541 Pelham Road, New Rochelle, N.Y. 10805

Filed Oct. 14, 1975, Ser. No. 622,162
Int. Cl.² A61B *10/00, 17/00, 17/32*
U.S. Cl. 128—2 B 37 Claims



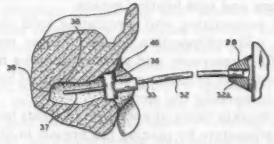
1. A multi-purpose surgical instrument for subcutaneous use comprising probe means in the nature of an elongate and generally slender member having a generally uniform transverse cross-section along the longitudinal axis thereof and having a bearing surface portion at the probing free end thereof; and clamping means arranged for movement in a direction generally parallel to said axis of said probe means and having an end portion thereof movable between a first clamping position wherein said end portion abuts against said bearing surface portion and a second releasing position wherein said end portion is removed or spaced from said bearing surface portion, whereby said bearing surface portion and end portion together form a clamping device in the nature of a vice which can be opened and closed by relative movement therebetween along a direction generally parallel to said axis of said probe means.

3,995,620

AIR CALORIC DELIVERY TUBES

John M. Epley, Portland, Oreg., assignor to Instrumentation & Control Systems, Inc., Addison, Ill.

Filed Nov. 5, 1975, Ser. No. 629,021
Int. Cl.² A61B *19/00*
U.S. Cl. 128—2 R 6 Claims



1. An air caloric delivery tube for use with air caloric stimulation systems used in measuring vestibular responses of patients comprising
a main tube portion having a nozzle end for extending into the ear of a patient,
said delivery tube including means for coupling to the air caloric stimulation systems which are equipped to supply air at controlled temperatures and flows to the ears of the patients,
said coupling means including a rigid nipple,
a nipple connecting tube joining said main tube portion, and said nipple,
the inner diameter of said main tube portion being smaller than the inner diameter of said rigid nipple,
shield means on said main tube portion removed from said nozzle end for locking said delivery tube in the ear of a patient with the shield means abutting the tragus of the patient's ear while preventing the nozzle end from impinging on the tympanic membrane of the patient,
said shield means comprising a hollow cylindrical section, and

the longitudinal axis of said cylindrical section being normal to the longitudinal axis of said means tube portion.

3,995,621

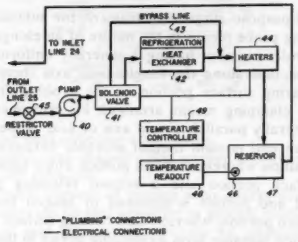
LIQUID COOLED BRASSIERE AND METHOD OF DIAGNOSING MALIGNANT TUMORS THEREWITH

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of William Elkins, San Jose; Bill Alvin Williams, Morgan Hill, and Ernest Glenn Tickner, Mountain View, all of Calif.

Filed Jan. 27, 1976, Ser. No. 652,948

Int. Cl.² A61B *5/06;* **A61F** *7/00*

U.S. Cl. 128—2 H **12 Claims**



1. A device for enhancing the detection of cancer in the breasts of a women comprising:

a breast and upper torso conforming garment comprising means for uniformly and simultaneously cooling the skin tissue of said breast by the perfusion of cooling fluid through said cooling means;

means for controlling the temperature of said cooling fluid;

means for refrigeration of said cooling fluid;

means responsive to said controlling means for heating said cooling fluid;

a reservoir for holding said cooling fluid;

valve means responsive to said controlling means for controlling the flow of cooling fluid between said refrigeration means and said heating means;

means for pressurizing and circulating said cooling fluid through said refrigeration means, heater means, valve means, fluid reservoir, and garment cooling means.

11. The method of enhancing the detection of breast cancer in a woman comprising the steps of:

a. cooling the skin tissue of a woman's breasts below normal room temperature by placing the breasts in close contact with a conforming garment comprising liquid-perfused cooling panels, said panels maintained at said temperature by the flow of cooling fluid therein;

b. removing the conforming garment; and

c. scanning the thermal pattern of the skin with an infrared scanning device.

3,995,622

DEVICE FOR DETERMINING CHANGED PULSES

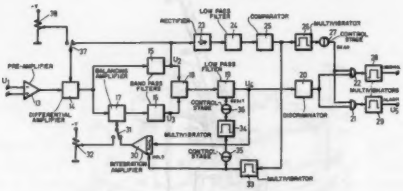
Lars Carl Ernst Nordgren, and Christer Ivar Malmstroem, both of Uppsala, Sweden, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 126,660, March 24, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,718

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 A **12 Claims**

1. A device for detecting pulses changed in form of a pulse sequency, such as widened extra systoles in an electrocardiogram, comprising a filter means or sieving out from the energy frequency spectrum of a pulse sequence frequency portions characteristic for the form and duration of the pulse sequence and means evaluating said frequency portions for pulse identification, wherein said filter means comprises a total of two band pass filters for generating two separate pulse sequences from the original pulse sequence, a first pulse sequence having only such frequencies which are characteristic for both pulses not changed in form and pulses changed in form and a second pulse sequence having only such frequencies which are characteristic for pulses not changed in form and wherein said evaluating means comprise an energy calculator connected to the outputs of the band pass filters, said energy calculator



calculating the difference of the energy contents of the separate two pulse sequences, and a threshold discriminator connected to the output of said energy calculator, said discriminator generating a signal when the difference between the energy contents of the two separate pulse sequences exceeds a prefixed value, and an alarming device connected to the output of said discriminator and generating an alarming signal when the discriminator generates an output signal.

3,995,623

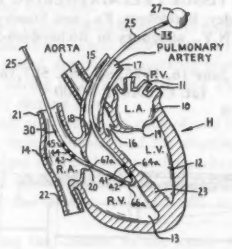
MULTIPURPOSE FLOW-DIRECTED CATHETER

Lawrence W. Blake, Costa Mesa; Clement E. Lieber, Yorba Linda; Harold J. C. Swan, Beverly Hills, and William Ganz, Los Angeles, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 535,379, Dec. 23, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,141

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **10 Claims**



1. A flow-directed catheter comprising a tube having a distal artery located portion, a ventricular portion proximally of said distal portion, and an atrial portion proximal to said first two portions, an inflatable balloon on said distal portion adapted to pull the tube through the right atrium and right ventricle of the heart and into the pulmonary artery causing an entrance section of said ventricular portion of the tube to enter said ventricle in one direction and causing an exit section of said ventricular portion to exit the ventricle in a different direction, at least one ventricular electrode on said exit section of said ventricular portion adapted to be positioned in said ventricle, and means stiffening said entrance section of said ventricular portion which emerges from said atrium into said ventricle, said stiffening means producing an abrupt reduction of the stiffness of the tube on the proximal side of said electrode and forming a sharp bend between said entrance

and exit sections of said ventricular portion of the tube to press said electrode against the myocardial wall between the left and right ventricles.

3,995,624

INSTALLATION FOR THE PROCESSING OF EKG SIGNALS

Michael Maas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

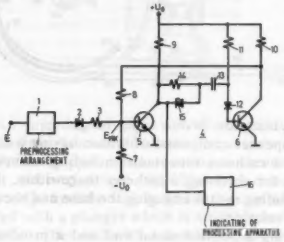
Filed Dec. 19, 1974, Ser. No. 534,574

Claims priority, application Germany, Dec. 22, 1973, 2364312

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R 2 Claims



1. In an installation for the processing of EKG signals, including a threshold element for detecting R-displays in the EKG; a signal suppressor element for suppressing the EKG signal in the signal channel for a predetermined time period after each R-display detected by said threshold element, said signal suppressor element comprising a monostable flip-flop including two capactively reactively connected transistors, one said transistor forming said threshold element for the R-displays of said EKG signals, said last-mentioned transistor having a collector resistance, said flip-flop having a condenser charged to a predetermined initial voltage value preceding the incidence of the respective R-display through the collector resistance of the blocked threshold element transistor, said suppressive time period being determined by the time span within which said flip-flop condenser discharges to a lower cutoff voltage value for said flip-flop through a base resistance of the other transistor and through the collector-emitter section of the threshold element transistor responsive to the latter being controlled into a conductive condition upon the incidence of the R-display, the improvement comprising: a high-ohmic resistance relative to the collector resistance of the threshold element transistor being connected in series in the charging path of said flip-flop condenser for increasing the charging time constants of said flip-flop condenser to a value so that, at heart frequencies not exceeding a median normal heart frequency value of about 80/min, the charging time period for a full condenser charging essentially corresponds to the time differential between R-display spacings and the refractive period of the heart at the selected heart frequency; and a diode bridging said high-ohmic resistance for discharging said condenser during said refractive period.

3,995,625

INHALATION DEVICES

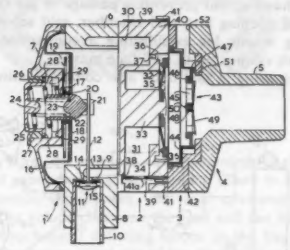
David Alan Needham, Keighley, England, assignor to Cyprane Limited, Keighley, England

Filed Oct. 15, 1974, Ser. No. 514,763

Claims priority, application United Kingdom, Oct. 18, 1973, 48648/73

Int. Cl.² A61M *16/00*

U.S. Cl. 128—142.2 5 Claims



1. A device for providing a gas-air mixture or a pure gas supply to a patient, the device comprising a housing including a first chamber defining a breathing gas passage a second chamber defining an air passage and, downstream of both said first and second chambers, a third chamber defining a breathing gas air passage, from which the patient's breathing supply is taken; demand valve means responsive to patient inhalation for admitting gas into said first chamber; air inlet means for admitting air to said second chamber; a non-return valve means for allowing air to flow from said second to said third chamber said second chamber including an outlet opening downstream of said air inlet means and of which the periphery thereof defines a valve seat surface, said non-return valve means comprising a flexible valve means mounted over said outlet opening and being engageable with said seat surface, said seating surface forming part of an upstream wall of said third chamber; at least one passage means from said first to said third chamber by passing said second chamber, said passage means comprising an orifice opening into said third chamber directly adjacent and upstream of said valve seat surface and spaced from said valve seat surface by a backward - facing step, whereby when suction is applied by the patient, air is drawn through said non-return valve from said second chamber to said third chamber thereby creating an aspiration effect at said backward-facing step actuating said demand valve means and causing breathing gas to flow through said passage to provide a gas-air mixture in said third chamber and means for over-riding said demand valve means to allow a constant flow of gas into said first chamber and through said passage means into said third chamber with said non-return valve means held closed.

3,995,626

CONNECTOR DEVICE FOR BREATHING APPARATUS

Fredric C. Pearce, Jr., Box 186-A, Rte. 1, Winter Garden, Fla. 32787

Filed June 20, 1975, Ser. No. 588,889

Int. Cl.² A62B *7/04*

U.S. Cl. 128—142.2 6 Claims

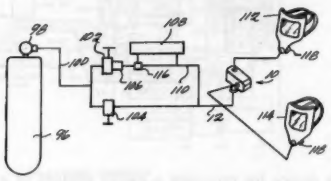
1. In a breathing apparatus including a container for gas under pressure, a regulating device connected to the container, said regulating device having means for supplying gas at atmospheric pressure on demand and means for supplying gas at the container pressure, at least one face mask having an exhaust valve and a conduit connected to the face mask for supplying gas thereto, the improvement comprising:

a connector device including a body having a chamber therein,

a first opening in said body communicating with said chamber, said first opening having means for establishing a fluid tight connection with said regulating device,

a second opening in said body also communicating with said chamber, said second opening having an apertured wall extending across said second opening and flexible disc valve means mounted on said apertured wall for permitting escape of gas from said chamber through said apertured wall in response to the presence of a lower pressure existing externally of said body relative to the pressure in said chamber, but preventing passage of gas through said second opening into said chamber, said second opening having means for establishing a connection with said conduit connected to said face mask,

a third opening in said body also communicating with said



chamber, said third opening having at one end thereof a first apertured wall extending there across and a second apertured wall located at a distance from said first apertured wall and closer to the external end of said third opening, said first apertured wall having flexible disc valve means mounted thereon for permitting escape of gas from said chamber to said second apertured wall, but preventing passage of gas from the exterior of said body into said chamber, said second apertured wall of said third opening having flexible disc valve means mounted thereon and movable between a closed position wherein escape of gas from said chamber through said first apertured wall of said third opening is prevented and an open position wherein escape of gas therethrough from said chamber and through said first apertured wall and flexible disc valve means mounted thereon is permitted.

3,995,627

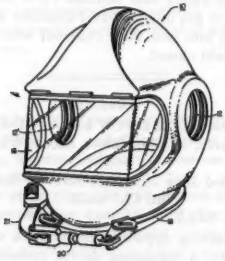
DIVING HELMET SYSTEM

Wilbur J. O'Neill, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1972, Ser. No. 306,944

Int. Cl.[2] A62B *18/04*

U.S. Cl. 128—142.7 **14 Claims**



1. A diving helmet system comprising:

A. a diving helmet body;

B. said diving helmet body including a window;

C. said diving helmet system including receiver means constructed and arranged to receive insertable gas flow control modules;

D. a first gas flow control module removably supportable by said receiver means, to accommodate a first gas supply arrangement;

E. said helmet system being constructed and arranged to receive a second and different gas flow control module that can be removably supported by said receiver means to accommodate a second, and different gas supply arrangement;

F. gas passageway means for communicating the interior of said helmet body with an inserted one of said gas flow control modules; and

G. sealing means for effecting a diving helmet to diver seal.

3,995,628

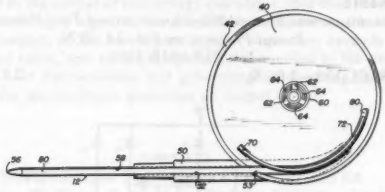
CATHETER INSERTION DEVICE

John A. Gula, Dallas; Thomas C. Thompson, Richardson; John Ellis Kling; John L. Center, both of Dallas, all of Tex., and Bert S. Bodnar, Park Ridge, Ill., assignors to Travenol Laboratories, Inc., Dallas, Tex.

Filed Apr. 25, 1975, Ser. No. 571,496

Int. Cl.[2] F24C *15/10*

U.S. Cl. 128—214.4 **20 Claims**



1. A catheter insertion device comprising:

a catheter dispenser comprised of a base having a catheter outlet and a catheter receptacle including an inwardly-facing wall for receiving a catheter therewithin, the dispenser including means engaging the base and receptacle in rotating relation;

a needle having a pointed distal end and a proximal end secured to the dispenser outlet;

a catheter wound inside the inwardly-facing wall of the receptacle, the catheter extending through the dispenser outlet with its distal portion lying in the needle; and

guide means inside the dispenser engaging a portion of the catheter near the dispenser outlet to guide the catheter downwardly towards the outlet as the receptacle is rotated with respect to the base.

3,995,629

ANESTHESIA DEVICE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed June 23, 1975, Ser. No. 589,508

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—215 **30 Claims**

1. A device for performing an anesthesia procedure on a patient, comprising: sleeve means having an end portion for placement adjacent the patient's body, hollow needle means received in the sleeve means for relative longitudinal movement thereof, said needle means having a tip for puncturing into the patient's body, and means for biasing the sleeve means and needle means relative each other in a direction exposing said tip from the end portion for puncturing into the patient's body.

3,995,630

INJECTION SYRINGE WITH TELESCOPIC ASSEMBLY BETWEEN CARTRIDGE AND VIAL

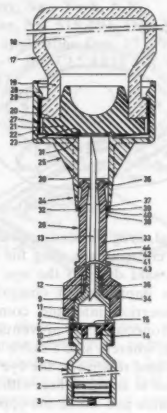
Johannes Theodorus Adrianus van de Veerdonk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,969

Claims priority, application Netherlands, Sept. 12, 1974, 7412096

Int. Cl.² A61M 5/00

U.S. Cl. 128—218 DA 3 Claims



1. An injection syringe which comprises a cartridge to which an injection needle is attached, a vial which is closed by a pierceable stopper which constitutes a container for a medicament, and a telescopic assembly which detachably connects the cartridge and the vial, in which the cartridge at one end is provided with a plunger which is movable inside the cartridge and at the other end with a needle mount which at the cartridge end comprises a substantially cylindrical wall portion and at the other end is provided with a sleeve in which the injection needle is secured and in which the telescopic assembly comprises an outer telescopic member which is connected to the vial and an inner telescopic member of which one end is detachably connected to the cartridge and whose other end extends into the outer telescopic member, the injection needle furthermore extending through a central bore in the inner telescopic member beyond its end, characterized in that the inner telescopic member at the side of the cartridge is provided with an outer collar of relatively great wall thickness whose inner surface frictionally engages with the outer surface of the cylindrical portion of the needle mount and with an inner collar of relatively small wall thickness whose inner surface engages with the outer wall of the cylindrical sleeve.

3,995,631

OSMOTIC DISPENSER WITH MEANS FOR DISPENSING ACTIVE AGENT RESPONSIVE TO OSMOTIC GRADIENT

Takeru Higuchi, Lawrence, Kans., and Harold M. Leeper, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

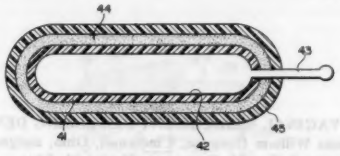
Continuation-in-part of Ser. No. 106,161, Jan. 13, 1971, abandoned. This application Sept. 25, 1972, Ser. No. 291,686

Claims priority, application Israel, Jan. 11, 1972, 38539

Int. Cl.² A61M 31/00; B65D 35/28

U.S. Cl. 128—260 10 Claims

1. An osmotic active agent dispenser comprising a bag formed of a flexible, relatively impervious material as a means for containing an active agent and provided with a means for releasing the active agent to the exterior of the device, the bag encapsulated with a film comprised of an osmotically effective solute which solute when in solution exhibits an osmotic pressure gradient against an external fluid, the film surrounded by a wall comprised of a shape retaining material having in at least a part controlled permeability to the exterior fluid, and wherein in operation when the bag is charged with at least one active agent, the agent is dispensed from the device by fluid



permeating from the external environment through the permeable wall producing a solution of the solute in a tendency towards osmotic equilibrium with said environment, same increasing the volume between the wall and the bag thereby generating mechanical deflating forces on the bag, which in turn ejects the active agent out of the dispenser at an osmotically controlled rate over a prolonged period of time.

3,995,632

OSMOTIC DISPENSER

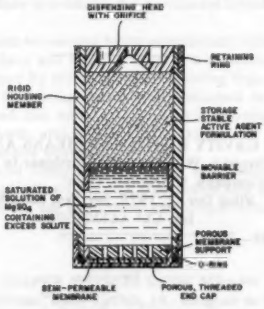
Masahiro Nakano; Takeru Higuchi, and Anwar Hussain, all of Lawrence, Kans., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 357,228, May 4, 1973, abandoned, which is a continuation of Ser. No. 106,133, Jan. 13, 1971, abandoned. This application Sept. 30, 1974, Ser. No. 510,753

The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.

Int. Cl.² A61M 31/00

U.S. Cl. 128—260 12 Claims



1. An osmotic active agent dispenser comprised of a first compartment of relatively impervious material containing an active agent and provided with means for releasing the active agent to the exterior of the dispenser, and a second compartment of controlled permeability to water containing a solution of an osmotically effective solute which exhibits an osmotic pressure gradient against water, the said first and second compartments having a barrier member such that the said first compartment diminishes in volume in response to an increase in volume of the solution in the said second compartment via absorption of water by osmosis therein, and defining a means for establishing a substantially zero order rate of release, as water flows into the dispenser in a tendency towards osmotic equilibrium with its environment, so that the active agent is continuously squeezed thereout at an osmotically controlled

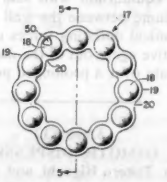
rate over a prolonged period of time; said active agent formulated in a form which is a chemically stable solid or semisolid at storage temperatures but a readily dispensible melt at the temperatures of the prospective situs for the osmotic dispenser, whereby the stability and uniformity of dosage of the said active agent over the said prolonged period of time are assured.

3,995,633

VAGINAL MEDICAMENT DISPENSING DEVICE

Thomas William Gougeon, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 2, 1975, Ser. No. 636,899
Int. Cl.² A61M *31/00*; A61F *5/46*
U.S. Cl. 128—260 14 Claims



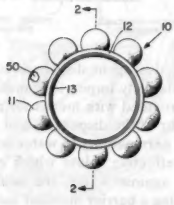
1. An article for use within the vaginal cavity characterized by: a plurality of containers having walls, at least a portion of said walls being of a semi-permable membrane and thereby releasably containing a biologically active agent, a means for maintaining said plurality of containers in a substantially arcuate flat sequential assemblage comprising a thin flexible planar seal fin encompassing and receiving the outside surface of said containers at a substantially central location thereby maintaining the containers in an articulated configuration.

3,995,634

VAGINAL CAVITY DISPENSING MEANS AND METHOD

James Lee Drobish, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 2, 1975, Ser. No. 636,897
Int. Cl.² A61M *7/00*
U.S. Cl. 128—260 15 Claims



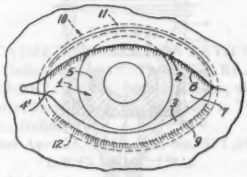
1. An article for use within the vaginal cavity characterized by: a plurality of containers, said containers releasably containing a biologically active agent, said containers protruding through a dimensionally stable, pliable retaining ring, said containers being held in place in said retaining ring by virtue of their bulbous shape.

3,995,635

OCULAR INSERT

Takeru Higuchi, Lawrence, Kans.; Anwar A. Hussain, Lexington, Ky., and John W. Shell, Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 179,129, Sept. 9, 1971. This application Nov. 4, 1974, Ser. No. 520,277
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² A61K *27/12*; A61M *31/00*
U.S. Cl. 128—260 13 Claims



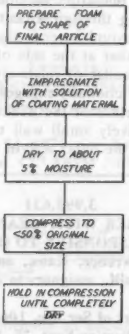
1. In a non-corneal, drug dispensing ocular insert comprising a flexible body containing a drug for application to the eyeball to dispense said drug to the eye over a prolonged period of time, the improvement comprising a means for permitting facile insertion into and comfortable retention within the eye, and concomitantly preventing the expulsion of the insert therefrom, wherein said flexible body comprises an annular ring that is sized relative to the eye so it can be placed about the eyeball and in contact therewith, completely posterior to the sulcus sclerae and within the upper and lower cul de sacs, the width of the ring being such that the ring is virtually invisible in the palpebral fissure when the eyelids are open.

3,995,636

CONSTRAINED CATAMENIAL DEVICE EMPLOYING ADHESIVE COATING

Jerome L. Murray, 652 First Ave., New York, N.Y. 10016, and Francis R. Gardiner, 43 Park Road, Sparta, N.J. 07871

Continuation-in-part of Ser. No. 436,391, Jan. 24, 1974. This application May 7, 1975, Ser. No. 575,199
Int. Cl.² A61F *13/20*
U.S. Cl. 128—285 10 Claims


PREPARE FOAM TO SHAPE OF FINAL ARTICLE
IMPREGNATE WITH SOLUTION OF COATING MATERIAL
DRY TO ABOUT 5% MOISTURE
COMPRESS TO <50% ORIGINAL SIZE
HOLD IN COMPRESSION UNTIL COMPLETELY DRY

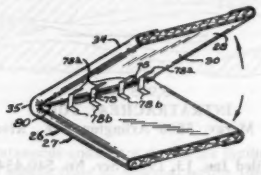
1. A catamenial device comprising:

a segment of compressed hydrophilic polymeric foam in compression to less than 50 percent of its original dry volume;

a constraining means for maintaining said segment in compression, providing lubrication for insertion of said segment into an animal's body cavity, and adapted for rapid

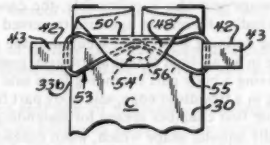
disintegration in said body cavity, said constraining means comprising a composition containing citric acid and sodium bicarbonate.

3,995,637
DIAPER WITH WAIST MEANS
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Division of Ser. No. 519,493, Oct. 31, 1974, Pat. No. 3,951,150. This application Dec. 17, 1975, Ser. No. 641,402
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 6 Claims



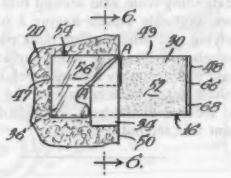
1. A disposable diaper, comprising: an absorbent pad assembly having a pair of waistline portions, a crotch portion intermediate the waistline portions, a lateral fold in the crotch region along a laterally extending fold line, and means for longitudinally constraining the pad assembly comprising an elastic means extending across the location of the lateral fold line and being unstretched when the diaper is folded and expanded only when the pad assembly is longitudinally unfolded.

3,995,638
DIAPER WITH RETAINED END SECTION
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Division of Ser. No. 519,493, Oct. 31, 1974, Pat. No. 3,951,150. This application Dec. 17, 1975, Ser. No. 641,855
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 3 Claims



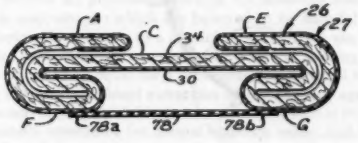
1. A disposable diaper, comprising:
an absorbent pad assembly having a pair of side edges, an absorbent pad, a front surface, a backing sheet of a fluid impervious material defining a back surface of the pad assembly, said backing sheet having an end section adjacent an end edge of the pad assembly, said end section being folded back with the back surface of the end section facing the back surface of an underlying portion of the backing sheet, and means for retaining at least a portion of the back surface of the end section against the back surface of the backing sheet portion underlying said end section.

3,995,639
DIAPER HAVING TAB FASTENER WITH AN ANCHORING LEG FOLDED ON BIAS
Ernest Cheslow, Glencoe, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Dec. 19, 1975, Ser. No. 642,261
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 16 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:
an integral elongated tape segment attached to said diaper at a marginal location thereof, having a free working end and a fixed end including at least two anchoring legs, each of said anchoring legs having an adhesive coating on one face thereof;
a pressure-sensitive adhesive coating on one face of said free working end; and
release means on the diaper for releasable attachment to said adhesive coating on said free working end;
at least one of said anchoring legs being folded over on a bias so that a portion of the adhesive-coated face thereof is juxtaposed to an adjacent portion of the same adhesive-coated face and the remainder of the same adhesive-coated face is available for permanent attachment to the diaper;
said tab fastener means being permanently attached to the facing sheet and backing sheet at a marginal location of said diaper by means of said anchoring legs, at least one of said legs being permanently attached to said facing sheet and the remainder of said anchoring legs being permanently attached to said backing sheet by means of said adhesive coatings;
said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

3,995,640
DIAPER WITH ELASTIC MEANS
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 5, 1976, Ser. No. 646,697
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 22 Claims



1. A disposable diaper, comprising: an absorbent pad as-

sembly having an absorbent pad, a pair of waistline portions, a crotch portion intermediate said waistline portions, a front surface, a back surface, a pair of side edges, a pair of end edges connecting said side edges, a plurality of longitudinally extending folds defining an inverted pleat configuration of the pad assembly, said pad assembly having a first pair of fold lines defining a longitudinally extending central panel, a second pair of fold lines defining a pair of intermediate back panels underlying the back surface of the central panel and a pair of side panels extending from said second fold lines around said first fold lines, said side panels having a pair of outer back panels underlying said intermediate back panels and a pair of outermost panels overlying the front surface of said central panel, and said pad assembly having an elastic band having a first end secured to the back surface of the central panel and a second end secured to the back surface of one of said back panels adjacent said second fold line.

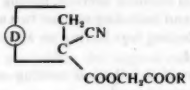
3,995,641

SURGICAL ADHESIVES

Richard L. Kronenthal, Fair Lawn, and Edgar Schipper, Highland Park, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Apr. 23, 1975, Ser. No. 571,042
Int. Cl.² F24C *15/16*
U.S. Cl. 128—335 **19 Claims**

1. A composition of the formula:



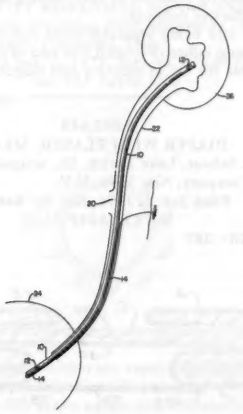
wherein Ⓓ is a cyclic 1,3 diene and R is an organic radical having from 1 to about 12 carbon atoms.

3,995,642

METHOD AND APPARATUS FOR RETAINING A DRAIN TUBE WITHIN A URETER

Edwin L. Adair, Littleton, Colo., assignor to Medical Dynamics, Inc., Littleton, Colo.

Filed Apr. 3, 1975, Ser. No. 564,792
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 R **3 Claims**



1. A method of preventing a drainage tube, disposed in a ureter and extending between a kidney and the bladder wherein its proximate end within the bladder is readily accessible by a cystoscope for removing the tube from the ureter, from moving by perstalsis toward the bladder to a position in which the proximate end thereof is difficulty accessible by a cystoscope for capturing same, the tube adapted to be installed in the position aforesaid through an incision in the ureter, said method comprising;

a. attaching one end of a flexible cord to the tube at a position between the incision and its proximate end,

b. inserting the tube through the incision and through the ureter into the bladder, the tube pulling the cord therewith,

c. threading the cord through the wall of the ureter in the locus of the incision and through body tissue to a position exteriorly of the body, and

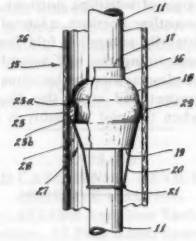
d. affixing the cord exteriorly of the body for preventing movement of the tube toward the bladder.

3,995,643

INTRATRACHEAL TUBE

Abraham D. Merav, 5800 Arlington Ave., Riverdale, N.Y. 10471

Filed Jan. 13, 1975, Ser. No. 540,454
Int. Cl.² A61M *16/00, 25/02*
U.S. Cl. 128—351 **20 Claims**



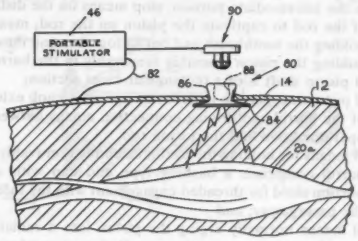
1. A device for intubation of a tracheal passage and operable with an external source of fluid with a gas flow outward through said passage from the lungs to the atmosphere, the device comprising a tube having a diameter less than that of a normal tracheal passage and having a distal end for insertion into said tracheal passage and an opposite proximal end, and a canopy of flexible material which is both distendible to a generally annular shape for sealing the space between the tube and the passage and also is collapsible, the canopy having a top part including therein an aperture traversed by said tube, the aperture defining a top edge secured to the outer surface of said tube in an air-tight seal at a first axial position thereon, and also having a body part extending from said top edge and terminating in a free distal edge, said body part further including inflatable first chamber means for distending said canopy to a generally annular shape which, when distended, defines a dome opening toward the distal end, and within said dome a second generally annular chamber, with said distal edge of the canopy being radially spaced from the tube and having diameter greater than the outer diameter of the tube adjacent thereto and thus defining an open distal end of said canopy, said device further comprising inflation means for communicating said source of fluid to said first chamber means for inflating same and thereby distending said canopy, into said dome shape, said canopy also being distendible by said gas flow entering the canopy via said distal end thereof and filling said second chamber, which thereby distends said canopy into said dome shape, said first and second chambers being inflatable both jointly, and independently of each other, for distending said canopy.

3,995,644

PERCUTANEOUS CONNECTOR DEVICE

Walter E. Parsons, Kissimmee, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 16, 1975, Ser. No. 613,734
Int. Cl.² A61N 1/36
U.S. Cl. 128—418 1 Claim



1. A percutaneous connector device for facilitating passage of electrical signals from an external source through the skin of a patient to internal portions of the body of said patient comprising:

A. a shell constructed of electrically conductive material having an enlarged disk shaped base portion for being implanted below the skin of said patient

B. a cylindrical portion having a first end portion integral with said enlarged disk shaped base portion and a second end portion extending outwardly therefrom for passing through the skin of said patient;

C. a socket with a predetermined depth provided in and through said second end portion of said cylindrical portion to form an inner circular wall having a larger diameter adjacent said first end portion than adjacent said second end portion;

D. plug means removably inserted in said socket for providing an electrical connection between said external source of electrical signals and said shell;

E. said plug means including:

i. a base portion,

ii. a post attached to and extending outwardly from said base portion for a length substantially equal to said predetermined depth of said socket,

iii. said post being provided with a pair of bisecting diametrically opposed slots extending substantially said length thereof and dividing said post into four equal parts,

iv. a pair of radially extending electrodes carried by said plug means for making electrical contact with said shell,

v. each of said pair of electrodes including conductive spring wire having an enlarged loop portion extending radially beyond said post and a pair of legs integral with said loop portion extending downwardly into one of said pair of bisecting diametrically opposed slots and terminating in end portions that extend through said base portion;

F. means for coupling said electrical signals from said external source to said end portions of each said pair of legs that extend through said base portion; and,

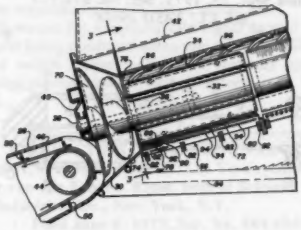
G. said enlarged loop portion of each of said pair of electrodes being resiliently biased radially outwardly for engaging said inner circular wall of said socket to produce a predetermined locking force between said shell and said plug means.

3,995,645

AXIAL FLOW COMBINE HAVING CONCAVE RELIEF

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 16, 1975, Ser. No. 641,220
Int. Cl.² A01F 12/20
U.S. Cl. 130—27 T 5 Claims



1. In an axial flow combine provided with

a. a casing having an infeed end arranged to receive crop material in a substantially axial direction,

b. a rotor extending generally axially in said casing rearwardly from the infeed end thereof,

c. rasp bar means extending along said rotor at spaced locations thereon,

d. and a concave supported within said casing at least partially along the lower surface portion of said rotor for cooperation with said rasp bar means on said rotor to form a threshing region in which crop material is threshed therebetween in a substantially radial movement and said concave having an inlet end adjacent the infeed end of said casing; the improvement comprising in combination therewith:

e. a relief section in said inlet end of said concave and extending longitudinally thereof a predetermined distance inwardly from said inlet end and underlying the forward portions of said rasp bar means, thereby providing a thinning space adjacent the inlet end of said threshing region into which abnormally large masses of material may be accommodated in a generally axial direction and converted to radial movement prior to passing farther into said threshing region for primarily raidal movement therein and thereby minimize power requirements and wear upon the threshing components of the combine resulting also in minimizing customary thumping of the masses of material which normally occurs under similar conventional combine circumstances.

3,995,646

TOBACCO PROCESSING METHOD

Albert W. DeBrunn, 51 Diamond St., San Francisco, Calif. 94114, and Gregory R. Feist, 1432 Laguna, Burlingame, Calif. 94010

Continuation of Ser. No. 448,085, March 4, 1974, Pat. No. 3,874,392. This application Jan. 20, 1975, Ser. No. 542,647
The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.
Int. Cl.² A24B 15/02
U.S. Cl. 131—17 R 8 Claims

1. A method for processing tobacco for removing selected agents in said tobacco which are believed to be harmful and for restoring the tobacco to a condition suitable for use in a cigarette, said method comprising the steps of placing the tobacco in a boiling liquid for a preselected time period sufficient to obtain a significant extraction of said tobacco agents; subsequently drying the tobacco to a point at which is friable and generally unsuitable for normal cigarette usage; and subjecting the dried tobacco to an atmosphere generally at ambient temperature and containing water vapor and reducing the temperature of said atmosphere to far less than ambient for a

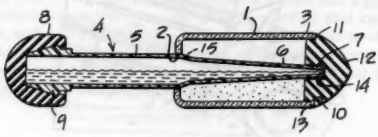
preselected period of time to restore the friable tobacco to a condition suitable for use in a cigarette.

3,995,647

COMBINED MIXER AND APPLICATOR DEVICE

Rudolph J. Kopfer, 1321 S. Eliseo Drive, Greenbrae, Calif. 94904

Filed Sept. 25, 1975, Ser. No. 616,771
Int. Cl.² A45D 29/18
U.S. Cl. 132—74.5 9 Claims



1. A mixer and dispenser for components of a mixture comprising

an outer container

an applicator extended through a first end into and being spaced from the outer container to form a space around the applicator for a compound, said applicator having an open end inside said container,

a sealing gland at the other end of said container, means in said gland engaged by said open end of the applicator for sealing said open end, said applicator having therein another component of said mixture,

said applicator being releasably held in said first end of said container for withdrawal from said sealing means,

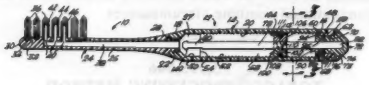
and means on said applicator outside of said first end for expelling out of and sucking into said inner applicator components to be mixed and dispensed.

3,995,648

TOOTHBRUSH AND TOOTHPASTE SUPPLY CONTAINER

Michael A. Kuryla, 2777 SW. 22nd Ave., Miami, Fla. 33133

Continuation-in-part of Ser. No. 505,327, Sept. 12, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,988
Int. Cl.² A45D 44/18
U.S. Cl. 132—84 B 1 Claim



1. An improved toothbrush and toothpaste container, in combination, comprising:

a toothbrush having a brush portion and a stem portion and including an internal passageway from one end of the stem portion to exit ports in the brush portion and said stem portion comprising a container including a barrel having a proximal end and a distal end with a threaded through passageway extending from an open distal end, said passageway being of reduced diameter at the proximal end and including an intermediate portion of a predetermined cross sectional area greater than that at the distal end and less than that at the proximal end and of a predetermined axial dimension,

a piston mechanism including a threaded piston in threaded engagement within the barrel and including an operator at all times exterior of the barrel effective to operate the piston to threadably move it axially within the passageway, a piston rod of a uniform cross section extending to said intermediate portion and including a distal portion of reduced cross sectional area extending axially in the intermediate portion a distance greater than the axial dimension of said piston, means on the piston normally urging the piston into a radially collapsed condition of a circumferential area sized for axial movement through the threaded portion of the passageway to remove the piston from said passageway and including abutment surfaces to coact with the rod to maintain the piston in threaded engagement within the passageway except when in the intermediate portion, stop means on the distal end of the rod to captivate the piston on the rod, means for holding the toothbrush and barrel together and means for holding the piston assembly removably in the barrel;

said piston shaft is of a rectangular cross section;

said piston mechanism includes an operator knob exteriorly of the barrel and driving connection means between the operator knob and the piston rod;

said means for holding the piston assembly removably in the barrel comprises a bushing type end cap with a nose portion sized for threaded engagement with the threads of the passageway; and

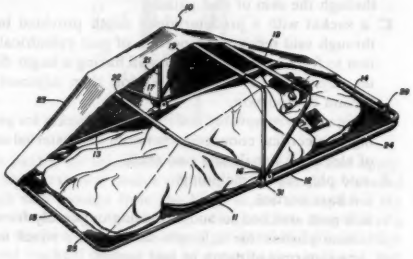
said means normally urging the piston into a radially collapsed condition comprises an O-ring circumferentially seated in an annular groove in the piston and being at all times under tension when in assembly.

3,995,649

COMPACTIBLE SHELTER

Vincent P. Robichaud, 244 Ellis Road, Westminster, Mass. 01473

Filed May 27, 1975, Ser. No. 580,874
Int. Cl.² A45F 1/16
U.S. Cl. 135—4 R 3 Claims



1. Compactible shelter, comprising

a. a rectangular frame having sides and ends,

b. a hinge located at an intermediate portion of each of the sides,

c. a plurality of U-shaped roof elements having their bights overlying the interior of the frame and the free ends of their legs pivotally attached to the hinges, and

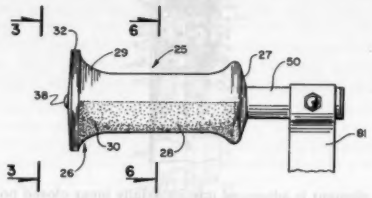
d. a flexible member formed of fabric joining the frame and the roof elements, the rectangular frame consisting of two U-shaped members, the legs of one U-shaped member being telescopically received within the legs of the other U-shaped member, so that the frame can be reduced in size to a collapsed condition in which the bight of the said one U-shaped member lies adjacent the free ends of the said other U-shaped member, the flexible member being fixedly attached on one end to the bight of one of the U-shaped members of the frame and at the other end to the bight on one of the U-shaped roof elements, this last-named roof element being adapted to lie against the other of the U-shaped members of the frame, this providing a means of entering and leaving the assembled shelter, and means being provided to lock the two together when they lie face-to-face.

3,995,650

ADJUSTABLE POSITIONED HANDGRIP FOR CANES, CRUTCHES, WALKERS AND OTHER AMBULATORY AIDS

Fred DiVito, Bronx, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.

Filed Sept. 10, 1975, Ser. No. 611,999
Int. Cl.² A61H 3/02
U.S. Cl. 135—72 8 Claims



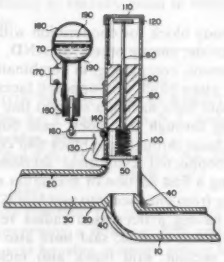
1. A handgrip assembly for an ambulatory aid, comprising:
an elongated rigid body adapted for grasping by a user's hand, said body having an axial cylindrical bore for receiving a cylindrical tube end of said ambulatory aid, said body having an oval portion of maximum size at one end and tapering gradually to a plane of minimum oval cross section near its other end, then gradually becoming circular to terminate in a circular portion at said other end;
attachment means for securing together said body on said tube end so that said body is axially immovable on said tube end; and
locking means for holding said body on said tube end in mutually nonrotational relationship, whereby said body presents two opposing broad sides for grasping by said user's hand; said locking means comprising:
radial protruding tube means in said tube end; and
radial rigid formation means in said cylindrical bore of said body arranged to mate and engage said radial protruding tube means to hold said body in a selected one of a plurality of angularly rotatable positions on said tube end.

3,995,651

VALVE FOR SHUTTING OFF GAS FLOW IN PIPES DURING EARTHQUAKES

Nellis C. Adams, La Canada, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed July 21, 1975, Ser. No. 597,542
Int. Cl.² F16K 17/36
U.S. Cl. 137—38 3 Claims



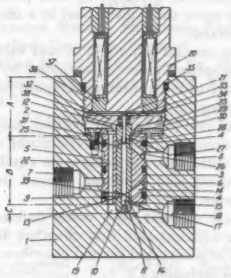
1. A valve for shutting off the flow of gas in pipes in response to vibrations comprising:
a hollow gas outlet pipe;
a hollow gas inlet pipe communicating with the outlet pipe, the outlet pipe entering the inlet pipe through the wall of the inlet pipe with the intersection of the pipes forming a flat valve seat;
a spring-loaded valve that leaves the valve seat unobstructed when locked and that covers the valve seat and thereby isolates the outlet pipe from the inlet pipe when unlocked;
catch means for locking and unlocking the valve, the catch means normally keeping the valve locked and unlocking it in response to an electrical signal; and
switch means for supplying said signal to said means, said signal being produced when said vibrations are produced, said switch means including a normally open mercury switch placed in series with a battery.

3,995,652

DIRECTIONAL CONTROL VALVE

Juan Belart, Walldorf, Germany; Leo Vermeyen, Kontich, and Pieter van den Eynden, Ranst, both of Belgium, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 6, 1975, Ser. No. 584,680
Claims priority, application Germany, July 24, 1974, 2435569
Int. Cl.² F15B 13/044
U.S. Cl. 137—102 4 Claims



1. A solenoid operated 3-way, 2-position directional control valve comprising:
a housing having a longitudinal axis;
a housing bore disposed in said housing coaxial of said axis;
an intermediate element disposed coaxial of said axis in and sealed to said housing bore, one end of said intermediate element engaging a first inner wall of said housing bore disposed transverse to said axis;
a retaining ring connected to a second inner wall of said housing bore disposed transverse of said axis, said retaining ring engaging the other end of said intermediate element to secure said intermediate element against motion in said housing bore;
an intermediate element bore disposed in said intermediate element coaxial of said axis;
a valve spool disposed in said intermediate element bore coaxial of said axis;
an armature controlled by a solenoid connected to one end of said housing adjacent said other end of said intermediate element, said armature being connected to one end of said valve spool;
an outlet port extending through the wall of said housing;
a fluid source inlet extending through the wall of said housing;
a return-reservoir connector extending through the wall of said housing;
said valve spool being associated with said outlet port, said fluid source inlet and said connector to enable said outlet port to communicate with said fluid source inlet in a first position of said valve spool and to enable said outlet port to communicate with said connector in a second position of said valve spool;

a first chamber disposed in said housing bore adjacent said one end of said valve spool, said first chamber being in communication with said connector;

a second chamber disposed in said housing bore adjacent the other end of said valve spool, said second chamber being in communication with said fluid source inlet and said outlet port;

a first channel disposed in said intermediate element parallel to and spaced from said axis to enable said first and second chambers to communicate with each other;

a pocket bore disposed in said valve spool coaxial of said axis;

a piston movably sealed to the inner surface of said pocket bore having one end projecting into said first chamber and connected to said solenoid;

passageways in said intermediate element and said valve spool to enable said pocket bore to communicate with said fluid source inlet;

said pocket bore having a bottom actuated by pressure at said fluid source inlet to move said valve spool in a direction away from said solenoid;

said piston having the other end thereof actuated by said pressure at said fluid source inlet to move said piston in a direction toward said solenoid;

a first surface on said one end of said valve spool disposed in said first chamber actuated by said pressure at said outlet port to move said valve spool in a direction away from said solenoid;

a second surface on said other end of said valve spool disposed in said second chamber actuated by pressure at said outlet port to move said valve spool in a direction toward said solenoid;

said actuation of said pocket bore bottom, said piston and said first and second surfaces and energizing said solenoid causing said valve spool to achieve an equilibrium position intermediate said first and second positions and block said outlet port;

said intermediate element bore being defined by a first leading edge adjacent said first chamber and a second leading edge adjacent said second chamber; and

said valve spool including

a first annular groove permanently in communication with said connector and in communication with said first chamber past said first leading edge when said valve spool is in said second position, and

a second annular groove permanently in communication with said fluid source inlet and in communication with said second chamber past said second leading edge when said valve spool is in said first position,

said first and second annular grooves being blocked by an associated one of said first and second leading edges when said valve spool is in said intermediate position.

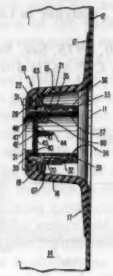
3,995,653

INFLATION DEVICE

Glenn H. Mackal, Buena Vista Drive, Ringwood, N.J. 07456; George E. Lardner, Reid Place, Hawthorne, N.J. 07507, and Joseph Maz, 305 Linola Vista Ave., North Haledon, N.J. 07508

Filed Aug. 1, 1975, Ser. No. 601,032
Int. Cl.² F16K *15/20*
U.S. Cl. 137—234 **8 Claims**

1. An inflation device for an inflatable article, said device comprising a body having an annular flange adapted to be sealed to a wall of an inflatable article at an opening therethrough, a threaded tubular nipple disposed on the body, the nipple having a radially inwardly extending transverse annular flange thereon forming a transverse annular seat within the nipple, a tubular closure element applied to the outer free end of the nipple and having threaded engagement with the nipple, the closure element having a perforated partition extending across its axially inner end, and a flexible resilient imperforate diaphragm overlying the axially inner surface of the partition and centrally attached thereto, the annular outer edge of the diaphragm sealingly engaging the annular seat when the closure element is advanced into its axially inner closed position on the nipple.

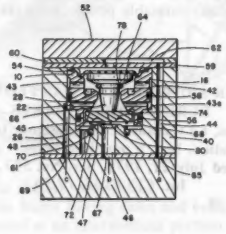


3,995,654

UNIVERSAL BODY BLOCK FOR FABRICATION OF FLUID LOGIC ELEMENTS AND FLUID LOGIC CIRCUITS

Paul Arvin, and Larry L. Seeley, both of Bryan, Ohio, assignors to The Aro Corporation, Bryan, Ohio

Continuation-in-part of Ser. No. 507,873, Sept. 20, 1974. This application Mar. 24, 1975, Ser. No. 561,153
Int. Cl.² F16K *27/00, 11/04*
U.S. Cl. 137—270 **14 Claims**



1. A universal body block for cooperation with inserts and valve means to provide, among others, an AND, NOT, OR or TIMING logic element, comprising, in combination:

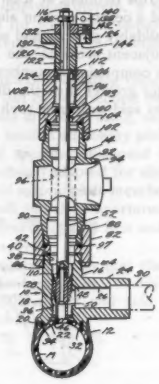
a unitary, single piece block with opposed faces and a cylindrical bore, said bore having a straight line axis of rotation extending through the block, said bore extending between said faces through said block and comprised of a plurality of connected cylindrical sections of distinct radii, including a first section of maximum radial dimension extending from one face into said block, each successive section having a decreased radius relative to the preceding adjacent section; said bore also including an intermediate section; said block also including a first separate passage from the first cylindrical section to the other face and said intermediate section having a second separate passage therefrom to said other face, whereby inserts and other valve forming parts may be inserted in the bore from the one face and positioned within said bore to provide a logic element.

3,995,655

APPARATUS FOR AND METHOD OF MAKING A SERVICE LINE CONNECTION THROUGH A FITTING

Robert E. Sands, Shelbyville, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Oct. 7, 1975, Ser. No. 620,502
Int. Cl.² F16K *43/00*
U.S. Cl. 137—318 16 Claims



1. An assembly for forming a hole in a main comprising:

a fitting having a through bore, said fitting at one end of said through bore being adapted to be secured to the exterior of the main where the hole is to be formed;

an annular shaped cutter member having a cutting end for cutting a coupon from the main;

a tubular tapping tool having a tapered end portion with an exterior cutting thread thereon of predetermined lead, said cutter member extending through said tubular tapping tool and having its cutting end projecting from the tapered end portion thereof;

means detachably securing said cutter member to said tapping tool whereby said cutter member and said tapping tool may be rotated and advanced simultaneously with said cutter member preliminarily cutting a coupon from the main to form a hole and then said tubular tapping tool further forming and progressively enlarging the hole in the main, and whereby said annular shaped cutter member may be slid axially from said tapping tool after the hole is formed; and,

means for removing the cutter member and the cut coupon therein slidably and axially from said tapping tool after the hole has been formed in the main so that the tapping tool remains partially in said hole and partially in the bore of said fitting to thereby assist in retaining the fitting on said main.

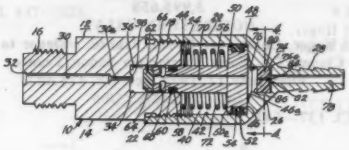
3,995,656

HIGH PRESSURE GAS REGULATOR

Justin W. Mills, Jr., Cinnaminson, N.J., assignor to Lif-O-Gen, Inc., Cambridge, Md.

Filed Feb. 15, 1972, Ser. No. 226,603
Int. Cl.² F16K *31/12*
U.S. Cl. 137—497 6 Claims

1. A pressure regulator for regulating the flow of high pressure gases comprising a housing, first and second regulator stages within said housing, passage means in said housing for connecting said first regulator stage with a high pressure gas source, said first regulator stage automatically reducing the pressure of said high pressure gas to a predetermined pressure range, passage means in said housing for directing the pressure regulated gas from said first regulator stage into said second regulator stage, said second regulator stage automatically regulating the gas flow from said first regulator stage to a constant predetermined level, passage means in said housing for discharging the regulated gas flow from said second regulator stage, said second regulator stage comprising a resilient flow control element having a gas passage therethrough, said flow control element being mounted in said housing so as to



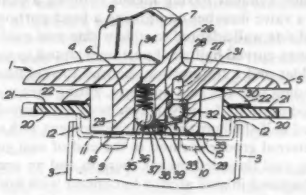
deform under the influence of pressurized gas flowing from said first regulator stage, the deformation of said flow control element in response to variations in the gas pressure acting thereon within said predetermined range producing a commensurate variation in size of said gas passage therein to provide a regulation of the gas flow therethrough.

3,995,657

VALVE

Edward Lawrence Horrey, Sheerness, England, assignor to Wasco Limited, Sheerness, England

Filed June 10, 1975, Ser. No. 585,611
Claims priority, application United Kingdom, June 12, 1974, 26154/74
Int. Cl.² B65D *51/16*; F16K *17/12*, *21/08*
U.S. Cl. 137—529 5 Claims



1. A valve assembly for automatically relieving the partial vacuum in an unvented tank or container caused by withdrawing the fluid contents therefrom, said valve assembly comprising:

means defining a channel, the outer end of said channel in open communication with the atmosphere and the inner end in open communication with the tank interior,

a valve seat disposed within the channel,

a valve member cooperative with said valve seat to seal the channel, and

biasing means to bias said valve member into engagement with the valve seat, comprising a pivoted member on a pivotal support, one end of which pivoted member engages the valve member and the other end of which engages means for imparting a turning moment to the pivoted member greater than the turning moment imparted to the pivoted member by the valve member alone, said ends of the pivoted member being on opposite sides of the point of pivotal support of said pivoted member,

the valve member being in a normally closed position in all orientations of the valve assembly, said valve member being biased to a normally closed position by the biasing means when the outer end of the channel is higher than the inner end and by gravity when the inner end of the channel is higher than the outer end, and

the valve member being urged out of engagement with the valve seat by atmospheric pressure to permit air to enter the tank when the pressure differential between the atmo-

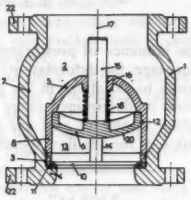
sphere and the interior of the tank is sufficient to overcome the biasing effect on the valve member and the valve member being returned to its normally closed position when the partial vacuum in the tank has been relieved.

3,995,658

NON-RETURN VALVE

Daniel Hager, Chalon sur Saone, France, assignor to Societe des Clapets T.J., Socla, Chalon sur Saone, France

Filed June 12, 1974, Ser. No. 478,487
Int. Cl.² F16K *15/06*
U.S. Cl. 137—543 1 Claim



1. A non-return valve comprising a substantially cylindrical one-piece conduit section having a radially inwardly extending shoulder and internal thread means adjacent said shoulder, a valve guide cylinder having a plurality of flow apertures disposed within said one-piece conduit section and having external thread means adjacent one end thereof in detachable engagement with the internal thread means on said section with said end bearing against said shoulder, the opposite end of said guide cylinder having means defining a central guide aperture, a valve member comprising a head portion having a cylindrical side wall adapted to slide within said guide cylinder and a convex curved half-shell portion adapted to seat against said shoulder and a rod portion secured to said head portion and extending through said aperture, spring means surrounding said rod portion of said valve member for normally biasing said curved half-shell portion into engagement with said shoulder, an internal groove formed in the end of said guide cylinder having said threaded means thereon and an annular sealing ring disposed in said groove in contact with said shoulder to provide sealing engagement between said valve member and said shoulder and between said cylinder and said shoulder.

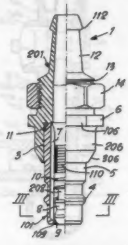
3,995,659

QUICK-COUPLING VALVED JOINT FOR PIPES EMBODYING VALVED MALE AND FEMALE COUPLING ELEMENTS

Bruno Cantore, Caselette (Turin), Italy, assignor to Pres Block S.p.A., Caselette (Turin), Italy

Filed June 23, 1975, Ser. No. 589,187
Claims priority, application Italy, June 28, 1974, 12867/74
Int. Cl.² F16L *29/00, 37/28*
U.S. Cl. 137—614.03 1 Claim

1. A quick-coupling joint for pipes, comprising a female coupling member having a plug-in bore, a sealing ring mounted in said bore and forming a first valve seat, a first valve member movably supported in said bore for seating on and unseating from said valve seat, a first spring constantly urging said first valve member into closed position on said first valve seat, and a male coupling member having a shaft section for nesting into the plug-in bore of said female coupling member, said shaft section of the male member having an axial flow passage, a second valve member housed in said passage, a second valve seat formed at the free end of the said shaft section at the terminus of said flow passage, a second spring in said passage urging said second valve member into closed position on said second valve seat, means for automatically shifting said valve members in respective opening directions against the action of said springs whenever the said male coupling member is nested in the plug-in bore of said female coupling member and for releasing said valve members on disconnecting the said coupling members so that said valve members are automatically urged by said springs into their respective closure positions, the flow passage of said male coupling member having at least three inwardly projecting axially extending ribs defining at least three flow paths between the ribs and a central portion along which said second valve member is slidably guided, said second spring comprising two axially adjacent sections, the first section being an anchoring section comprising a number of adjacent windings of normal diameter greater than the diameter of the central portion defined by said axial ribs such that said windings of



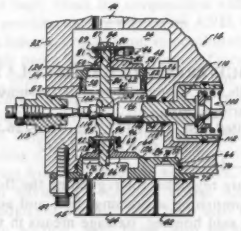
said anchoring section bear radially outwardly and forcefully against the inner edges of said ribs in the flow passage of said male coupling member, the second section of said second spring comprising a valve actuating section comprising a number of windings having each a normal diameter less than the inner diameter of said central portion and less than the inner diameter of said central portion and less than the diameter of said anchoring section so as to be freely movable in said flow passage to move with and bias said second valve member, said second valve member having a valve head formed with an arcuate cup-shaped portion cooperating with said second valve seat and terminating in a flat end surface which in the closed condition of said second valve member is flush with the external end surface of said second valve seat formed at the free end of the shaft of said male coupling member.

3,995,660

FLOW METERING AND DIVIDING VALVE

Howard B. Kast, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 8, 1975, Ser. No. 638,810
Int. Cl.² F16K *11/06*; F15C *1/04*
U.S. Cl. 137—625.48 7 Claims



1. A fluid metering and flow dividing valve comprising:
a housing:
first and second fluid chambers disposed in serial flow relationship in said housing:

a fluid inlet adapted to provide fluid under pressure to said first chamber;

a passageway establishing fluid communication between said first and second fluid chambers;

a first variable area metering valve adapted to meter the flow of pressurized fluid from said first chamber through said passageway to said second chamber, said first metering valve including a first stationary plate member having a first aperture disposed therein, a first movable shoe member adapted for sliding frictional engagement with said first plate member and for overlapping of said first aperture;

a second variable area flow dividing valve adapted to divide the flow of fluid out of said second chamber between a pair of fluid outlets in said housing, said second dividing valve including a second stationary plate member having second and third apertures disposed therein, a second movable shoe member adapted for sliding frictional engagement with said second plate member and for overlapping of said second and third apertures;

shaft means interconnecting said first and second movable shoe members;

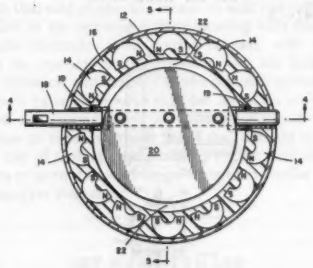
actuating means associated with said shaft means and responsive to signal means for selectively displacing simultaneously said shaft means and said first and second movable shoe members.

3,995,661

FLOW CONTROL VALVE FOR MAGNETIC PARTICULATE

Harvey Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Sept. 22, 1975, Ser. No. 616,173
Int. Cl.² F16K *1/226*
U.S. Cl. 137—807 **13 Claims**



1. A magnetic flow control valve for particulate having a composition including at least 50% magnetic particles comprising:

a. an annular housing;

b. a plurality of magnets spaced around and secured to the circumference of said housing;

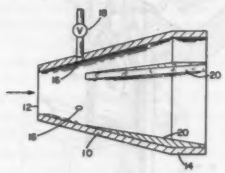
c. a valve assembly including a magnetic valve disc rotatable in said housing between a position of magnetic attraction with said magnets to shut off particulate flow and a plurality of open positions permitting a selected particulate flow rate.

3,995,662

FLUIDIC SWITCHES

Robert E. Fitzgerald, Wethersfield, and Robert F. Kampe, West Hartford, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed June 16, 1972, Ser. No. 263,843
Int. Cl.² F15C *1/04*
U.S. Cl. 137—825 **9 Claims**



1. A fluidic switch comprising:

a first chamber defining member, said first member having an entrance end through which a stream of fluid may be injected and a discharge end, said first member being at least in part comprised of oppositely disposed wall portions which diverge at a first angle with respect to the axis of a stream of fluid supplied through said entrance end;

a second chamber defining member, said second member being positioned immediately downstream of said first member and having an entrance end for receiving the stream discharged from said first member and a discharge end, said second member being at least in part comprised of oppositely disposed wall portions which have a lesser rate of divergence than the first member wall portions, said first and second chamber defining members cooperating to define a reaction chamber;

means for exercising control over the position with respect to said axis of a stream of fluid in the reaction chamber, said position control means including at least a first control port in one of said first member diverging wall portions, said control port being located in the vicinity of the free stream separation point of an injected stream of fluid; and

a plurality of rib means protruding into the reaction chamber, said rib means extending from the vicinity of the position control means to the vicinity of the second member discharge end and dividing the reaction chamber into a plurality of sectors, the height of said ribs being sufficient to insure contact with a deflected stream through the length of said first member.

3,995,663

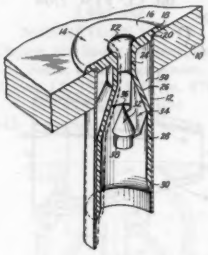
HIGH SOLIDS BRINE DISTRIBUTOR

Clifford R. Perry, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 21, 1974, Ser. No. 516,780
Int. Cl.² F15D *1/02*; **B65D** *59/00*
U.S. Cl. 138—38 **7 Claims**

1. A liquid distributing and erosion shield device for use in the upper end of an upright tube in a vertical tubular heat exchanger, said device comprising: a ferrule having a head portion dimensioned to seat centrally upon and close the upper end of said upright tube when installed, and a depending cylindrical sleeve portion dimensioned to fit snugly within said upright tube and having an interior side wall; means defining a central axial bore including an inner bore wall extending through and below said head portion for enabling formation and passage into said ferrule of a column of fluid, said bore being of substantially smaller diameter than said sleeve; an annular wall means within said ferrule including a radially divergent portion smoothly connecting said inner bore and an upper portion of the interior side wall of said sleeve; and an axially extending tapered fluid distributing member

centrally mounted in said ferrule below said bore, the smaller end of said fluid distributing member being disposed towards and in axial alignment with said bore and the larger end of said member being disposed above the lower edge of said sleeve portion; whereby, when the ferrule is installed, the falling



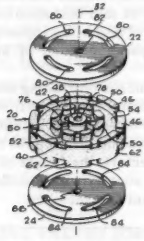
liquid column is uniformly distributed in a radially outward and downward direction by said tapered member onto the interior side wall surface of the sleeve portion of the ferrule which in turn delivers the fluid as a falling film onto the inside wall surface of said vertical tube.

3,995,664

FLOW CONTROL DEVICE

Walter R. Nelson, 2501 Redondo Beach Blvd., Gardena, Calif. 90249

Filed Mar. 13, 1975, Ser. No. 558,071
Int. Cl.² F15D 1/14; B05B 1/26
U.S. Cl. 138—43 16 Claims



1. A bidirectional flow control device comprising:

a generally cylindrical elastomeric, resilient member having

a longitudinal axis and including:

a disk portion having opposed faces;

an outer rim structure projecting from each face;

a generally circular array of spaced-apart flow control segments projecting from each face, the segments defining flow passages, the rim structure and flow control segments defining a generally circular outer channel; and

a plurality of orifices extending through the disk portion, the orifices being disposed radially inward of the flow control segments; and

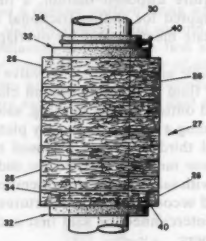
a rigid end plate overlying and in contact with the flow control segments and rim structure on each side of the disk portion, each plate having openings in communication with the outer circular channel; the outer circular channels, flow passages and orifices defining a tortuous flow path through the device, the flow passages forming flow restrictions that vary in accordance with the pressure applied to the device.

3,995,665

THERMAL INSULATION ELEMENT

George J. Monaghan, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed May 28, 1974, Ser. No. 473,624
Int. Cl.² F16L 9/14
U.S. Cl. 138—147 6 Claims



5. A method for thermally insulating a cylindrical body, comprising the steps of:

a. forming a plurality of resilient, flexible ring-shaped insulating elements of refractory fibrous materials stable at temperatures up to 2600° F, consisting of fibers selected from the group consisting of aluminum silicate, silica, alumina and glass; in which one side of said ring-shaped insulation element is severed;

b. placing a sufficient number of said ring-shaped insulation elements around said cylindrical body to thermally insulate the body;

c. compressing said ring-shaped insulation elements in an axial direction after placing said ring-shaped insulation elements around said cylindrical body; and

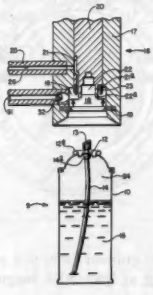
d. securing said elements under compression by a retaining means comprising retaining rings of rigid refractory material at both ends of the assembly.

3,995,666

METHOD FOR FILLING AEROSOL SPRAY DISPENSERS

Robert E. Michaels, Addison, Ill., assignor to VCA Corporation, Baton Rouge, La.

Filed Dec. 24, 1975, Ser. No. 644,347
Int. Cl.² B65B 31/00
U.S. Cl. 141—3 3 Claims



1. In a method for rapidly pressurizing an aerosol spray container having a liquid product therein, wherein a dispensing assembly is loosely positioned on the rim of the top of the container, air is evacuated from the container, the dispensing assembly is raised from the rim, a propellant gas under pressure is introduced into the container, and the dispensing assembly is fixedly attached to the container, the improvement

comprising positioning the dispensing assembly at a distance above the rim of the top of the container which will cause the pressurizing gas to enter the container at a velocity sufficient to cause intense agitation of the liquid thereby substantially saturating the liquid with the propellant gas in a very short time.

3,995,667

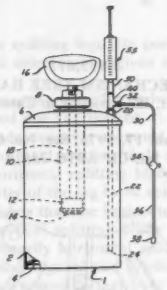
LIQUID HANDLING APPARATUS

Michael W. Brandt, P.O. Box 1092, Stillwater, Okla. 74074

Continuation-in-part of Ser. Nos. 462,364, April 19, 1974, abandoned, and Ser. No. 532,446, Dec. 13, 1974. This application May 1, 1975, Ser. No. 573,490

Int. Cl.² B65B *3/04*

U.S. Cl. 141—18 **16 Claims**



1. Apparatus for transferring liquid from a transfer container to a sprayer container, each container having an opening communicating with the inside thereof comprising: a first inwardly opening check valve in the opening communicating with the inside of the transfer container; a second inwardly opening check valve in the opening communicating with the inside of the sprayer container; each of said inwardly opening check valves comprising: a valve body having a passage formed therein and having a valve seat adjacent said passage; a seal element; a stem on said seal element; resilient means urging said seal element into sealing engagement with said valve seat, said stem extending through said passage; connector means; means securing said connector means to said valve body such that said connector means on said inwardly opening check valve in the opening communicating with the inside of the transfer container is in sealing relation with connector means in the opening communicating with the inside of the sprayer container; and support means on each container positioning each valve body such that the stems on seal elements in the first and second check valves are positionable in abutting relation to simultaneously move the first and second seal elements out of sealing engagement with the first and second valve seats to permit flow of liquid from the transfer container into the sprayer container.

3,995,668

NET WEIGHT FILLER

James A. Goodman, 9347 Springfield, Evanston, Ill. 62206

Filed Feb. 6, 1975, Ser. No. 547,596

Int. Cl.² B65B *1/14*

U.S. Cl. 141—34 **37 Claims**

1. An improved net weight filler for simultaneously filling a plurality of containers with a product, comprising:

a plurality of vertical support columns;

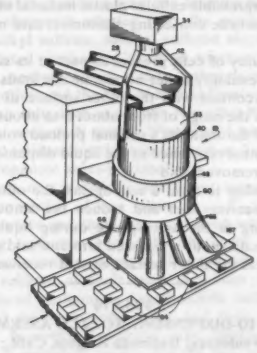
a weigh bucket;

weight measuring means coupled to said weigh bucket;

means for supporting said weigh bucket and weigh measuring means and for coupling same to said support columns;

a cavity having a plurality of chambers for receiving product from the weigh bucket and positioned relative to said weigh bucket to enable the product to flow from the weigh bucket into the cavity;

rotary motion means for accurately and efficiently distributing equal quantities of product volumetrically into each of said plurality of chambers by sluffing-off product from a chamber having more product to an adjacent chamber having less product; said cavity being coupled to the rotary motion means and said rotary motion means being coupled to the plurality of vertical support columns; and



chamber release means coupled to and below the cavity for releasing the product within each chamber into the plurality of containers; and

wherein the sluffing-off of product from a chamber having more product to an adjacent chamber having less product is achieved by the rotary motion means creating an equal circumferential pressure in each of the plurality of chambers.

3,995,669

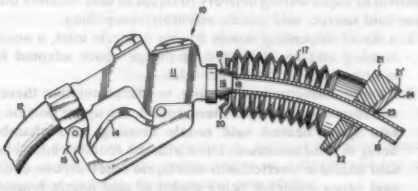
LIQUID-DISPENSING NOZZLE ASSEMBLY

Bernard E. Weidenaar, Hacienda Hgts., Calif.; Frederick L. Voelz, Orland Park; James J. Simnick, Riverdale, both of Ill., and Peter P. Moskovich, Jr., Gary, Ind., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 468,787, May 9, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,880

Int. Cl.² B65B *3/04*

U.S. Cl. 141—392 **15 Claims**



1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

1. a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;

2. a vapor collector surrounding, in spaced relation thereto

and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said nozzle is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing, or in proximity thereto, a sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said sealant means; and

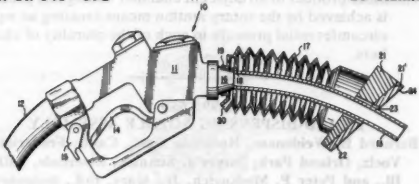
3. means for allowing removal of vapor from said chamber; the improvement comprising said sealant means comprising a compressible cellular plastic material obtained from an acrylonitrile-containing elastomer, said material having:
   a. a plurality of cells present as part of its structure;
   b. compressibility under normal nozzle loads of the material in contact with the other surface of the receiver inlet in the range of from about 5 to about 85% of that part of the material's original preload volume;
   c. substantial resistance to the liquid dispensed and vapor being removed, and
   d. the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

3,995,670

LIQUID-DISPENSING NOZZLE ASSEMBLY

Bernard E. Weidenaar, Hacienda Heights, Calif.; Frederick L. Voelz, Orland Park; James J. Simnick, Riverdale, both of Ill., and Peter P. Moskovich, Jr., Gary, Ind., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 468,787, May 9, 1974, abandoned. This application May 22, 1975, Ser. No. 580,118
Int. Cl.² B65B *3/04*
U.S. Cl. 141—392 **20 Claims**



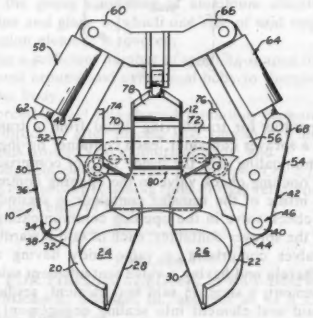
1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:
   1. a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;
   2. a vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said nozzle is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing, or in proximity thereto, a sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said sealant means; and
   3. means for allowing removal of vapor from said chamber; the improvement comprising said sealant means comprising a compressible cellular plastic material, said material having:
      a. a plurality of cells present as part of its structure;
      b. compressibility under normal nozzle loads of the material in contact with the outer surface of the receiver inlet in the range of from about 5 to about 85% of that part of the material's original preload volume;
      c. substantial resistance to the liquid dispensed and vapor being removed, and
      d. the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

3,995,671

SHEAR-MECHANISM-TREE HARVESTER

Leon A. Wirt, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 17, 1976, Ser. No. 658,553
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E **10 Claims**



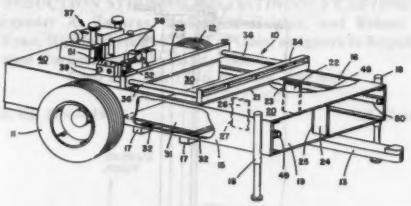
1. A shear assembly comprising:
   first frame means;
   first and second shear members pivotably mounted to the first frame means to be movable toward and away from each other;
   second frame means movable relative to said first frame means;
   first and second links pivotably connected to the second frame means;
   the first and second links being pivotably connected to the first and second shear members respectively;
   first and second cylinder means, each pivotably connected with the second frame means, the first cylinder means being pivotably connected with the first link, the second cylinder means being pivotably connected with the second link;
   the actuation of the first and second cylinder means in one direction actuating the links to move the shear members toward each other, the actuation of the first and second cylinder means in the other direction actuating the links to move the shear members away from each other;
   the second frame means being moveable relative to the first frame means upon said movement of the first and second shear members toward and away from each other; and
   means for guiding said movement of the second frame means relative to the first frame means during said movement of the first and second shear members toward and away from each other.

3,995,672

APPARATUS FOR AUTOMATIC WOODSPLITTING

Michael B. Binninger, 135 Rideout Way, Marysville, Calif.

Filed Sept. 10, 1975, Ser. No. 611,844
Int. Cl.² B27L 7/00
U.S. Cl. 144—193 A 9 Claims



1. Apparatus for splitting logs into portions having at least one cross-sectional dimension of given maximum size, comprising:

a. a bed for supporting a log for endwise movement along said bed toward one end thereof;

b. a splitting blade assembly mounted on said bed at said one end thereof, said splitting blade assembly comprising a generally horizontal splitting blade extending at least the full diameter of the log to be split spaced above said bed a distance less than the horizontal extent thereof and a generally vertical splitting blade extending only between said generally horizontal splitting blade and said bed, the splitting edge of said generally horizontal splitting blade being spaced further from said one end of said bed than the splitting edge of said generally vertical splitting blade;

c. a hydraulic ram structure including a wall mounted at the other end of said bed and positioned to enable a log to be received on said bed with one end thereof adjacent said splitting blade assembly and the other end thereof adjacent said wall and to exert force on said log endwise along said bed resulting in relative movement between said wall and said splitting blade assembly upon selective actuation of said ram;

d. a generally horizontal support plate resiliently mounted on said bed to receive and support said log when said ram structure is not actuated to exert force on said log, the plane of said support plate being closer to said bed than the plane of said generally horizontal splitting blade and said support plate terminating substantially at said splitting edge of said generally horizontal splitting blade; and

e. means for actuating said hydraulic ram structure including a reservoir for hydraulic fluid, a hydraulic fluid pump and means for driving said pump and controlling the flow of hydraulic fluid to and from said hydraulic ram structure to provide relative movement of given length between said wall thereof and said splitting blade assembly.

3,995,673

STABILIZED AIR BUBBLE-CONTAINING EXPLOSIVE COMPOSITIONS

Benedict John Grigaitis; Harold William Holden; Terrence Charles Matts, all of Mont Saint-Hilaire; Maurice Henry Miskow; Jean Paul Richard, both of St. Bruno, and Philip Faut Lit Seto, St. Lambert, all of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada

Filed Feb. 6, 1975, Ser. No. 547,474
Claims priority, application Canada, Feb. 21, 1974, 193099
Int. Cl.² C06B 45/02, 33/08, 31/32, 25/02
U.S. Cl. 149—21 7 Claims

1. A thickened and crosslinked, foamed, water bearing explosive composition comprising essentially water, at least one inorganic oxygen-supplying salt, a water-soluble organic nitrate sensitizer, a thickener, a thickener cross-linker, entrapped sensitizing gas bubbles and at least a dual-component gas bubble stabilizer which stabilizer acts to prevent the dissipation, coalescence, migration or breakdown of said entrapped sensitizing gaseous bubbles, said dual-component stabilizer comprising a combination of at least one foaming surfactant and at least one stabilizing surfactant wherein the quantity of foaming surfactant/stabilizing surfactant combination comprises between 0.1% and 10% by weight of the total explosive composition, said dual component stabilizer being selected from the mixtures:

A. At least one stabilizing surfactant selected from the group consisting of long Chain ($C_{12} - C_{22}$) aliphatic alcohols combined with at least one foaming surfactant compatible therewith selected from the group consisting of metal alkyl sulfates, salts of sulfated alcohols and their ethoxylated derivatives such as tricthanolamine lauryl sulfate, sodium lauryl sulfate, ethoxylated ammonium lauryl sulfate and the like, N-acylated aminosulfonic acids and their salts such as sodium N-methyl-N-coconut acid taurate, sodium N-methyl-N-palmitoyl taurate and the like and imidazoline derivatives such as 2-coco-1-(ethyl-β-oxipropanoic acid)-imidazoline;

B. At least one stabilizing surfactant selected from the group consisting of long chain ($C_{12} - C_{22}$) aliphatic primary amines and their salts combined with at least one foaming surfactant compatible therewith selected from the group consisting of metal alkyl sulfates, salts of ethoxylated sulfated alcohols such as sodium lauryl sulfate, ethoxylated ammonium lauryl sulfate and the like, N-acylated amino sulfonic acids and their salts such as sodium N-methyl-N-coconut acid taurate, sodium N-methyl-N-palmitoyl taurate and the like; and

C. At least one glyceryl monoester stabilizing surfactant combined with ethoxylated ammonium lauryl sulfate foaming surfactant,

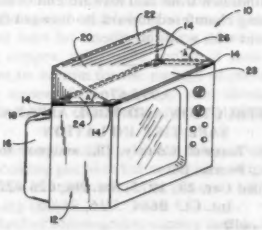
said resulting gas bubble-stabilized explosive composition being characterized by a sensitivity to blasting cap initiation in unconfined cartridges of 2 inch or less in diameter.

3,995,674

TELEVISION TOP PROTECTOR

Virginia E. Crawford, 1301 N. Main St., Miami, Okla. 74354

Filed Nov. 11, 1974, Ser. No. 522,338
Int. Cl.² A47C 31/10
U.S. Cl. 150—52 7 Claims



1. A television top protector to prevent the placement of food, drink, cigarette and sundries on a horizontal top of a television cabinet, the protector comprising:

a vertical back portion disposed on top of the television cabinet and extending the length of the rear of the television cabinet;

a front portion disposed on top of the television cabinet and extending the length of the front of the television cabinet, said front portion extending upwardly at an angle from 20° to 90° from the horizontal; and

side portions disposed on top of the sides of the television cabinet and extending the width of the sides of the television cabinet, said side portions extending upwardly at an angle from

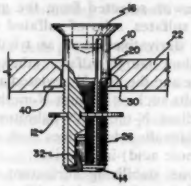
20° to 90° from the horizontal, said side portions intersecting and integrally attached to said back and front portions, thereby enclosing the protector.

3,995,675

CAPTIVE PANEL FASTENER ASSEMBLY

Frank J. Cosenza, Palos Verdes Peninsula, Calif., assignor to Tridair Industries, Torrance, Calif.

Filed Feb. 10, 1975, Ser. No. 548,470
Int. Cl.² F16B 43/00
U.S. Cl. 151—69 **2 Claims**



1. A captivated panel fastener assembly comprising a stud having an enlarged head, driving means in said head, a smooth shank portion adjacent said head and a threaded portion leading from said shank portion to the forward end of said stud, said threaded portion having a truncated minor diameter, said stud having three or more splines extending below said truncated minor diameter of the threads and axially from the forward end of said stud to a point adjacent but beneath the head of said stud, said stud having a central bore at its forward end, an annularly continuous substantially rigid retaining ring having inwardly extending tabs slidably riding within said splines, said retaining ring riding substantially perpendicular to the longitudinal axis of said stud, said tabs and said splines having minimal sliding clearance therebetween maintaining said retaining ring in said substantially perpendicular position, an end plug having a knurled mandril portion and an integral flange at one end thereof, said mandril portion being press-fitted within said bore of said stud such that the flange is contiguous to the forward end of said stud, said flange having a diameter slightly smaller than the minor diameter of the threaded stud but larger than the inner diameter of said tabs whereby said flange stops said retaining ring from being withdrawn from said forward end of said stud, and said flange being chamfered toward its outward face to facilitate engagement with a nut member.

3,995,676

RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION

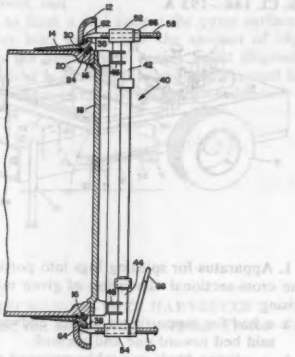
Robert Casey, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 28, 1975, Ser. No. 626,422
Int. Cl.² B60C 5/16, 25/00
U.S. Cl. 152—410 **3 Claims**

1. In a multi-piece wheel assembly comprised of a rim base member, a pair of flange members removably associated at either end thereof and formed to have an inflatable tire mounted therebetween, the rim base member defining first and second annular grooves circumferentially oriented adjacent one end, said first annular groove proximate said end, and a lock ring removably adapted to fit and positionable in said first annular groove and a seal member positioned in said second annular groove, the improvement comprising:

a bead set band formed to receive one flange member and mountable on said rim base member inwardly of said first annular groove and overlying said seal member, said lock ring while seated in said first annular groove for retaining said bead seat band on said rim base member;

said bead seat band defining a plurality of radial ports to communicate the interior of a mounted inflated tire with atmospheric air, said ports sealed by said seal member to block said communication between the interior of said



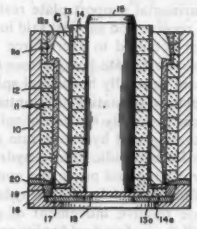
mounted tire and atmospheric air only while said bead seat band is urged against said lock ring seated in said first annular groove.

3,995,677

METHOD AND APPARATUS FOR CASTING HOLLOW INGOT MOLDS

T. Bruce Campbell, W. Middlesex, Pa., assignor to Thomas S. Campbell and Robert E. Campbell, both of W. Middlesex, Pa.

Filed Nov. 26, 1975, Ser. No. 635,608
Int. Cl.² B22C 9/02
U.S. Cl. 164—15 **12 Claims**



1. An improved method of casting a hollow ingot which comprises, providing an outer hollow metal flask member with a refractory lining cemented in position about and along its inner surface, providing an innermost solid metal core bar with a refractory coat cemented in position about and along its outer surface, placing the core bar with its coat thereon in a spaced relation within and along the flask member with its lining thereon to form a casting assembly, introducing a body of casting sand into the spacing in direct facing contact with the refractory lining and coat, forming and setting the body of sand into a centrally disposed casting cavity having an upwardly open pour end portion therein, all in such a manner as to define inner and outer sand wall portions respectively along the refractory lining and coating of substantially lesser thickness than the lining and coating, pouring molten metal into the pour open end portion of and filling the casting sand cavity and forming an ingot shape therealong after the molten metal

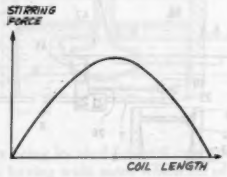
has cooled therein, and thereafter without disturbing the refractory lining and coat, removing the sand and the casting from an end of the spacing between the flask member and the core bar.

3,995,678

INDUCTION STIRRING IN CONTINUOUS CASTING

Alexander A. Zavaras, Broadview Heights, and Robert E. Ryan, Highland Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 20, 1976, Ser. No. 659,947
Int. Cl.² B22D 27/02
U.S. Cl. 164—49 19 Claims



1. Continuous casting procedure comprising
a. supplying molten metal to a cooled mold having an open outlet end while
b. advancing the metal in one direction through and beyond the mold outlet end as an ingot having a solid outer shell and a central pool of molten metal cooperatively defining a solid-liquid interface that tapers inwardly in said one direction, and
c. causing, by application of stirring force created by a moving magnetic field in the path of ingot advance throughout a stirring region having upstream and downstream extremities spaced apart in said one direction, a circulating flow of molten metal within said pool that sweeps along said interface in a direction substantially parallel to said one direction, while
d. producing and maintaining said magnetic field as a field for creating stirring force, in the stirring region, that decreases gradually and progressively in at least one direction from a central locality of said region to a substantially zero value at least at one extremity of said region for effecting gradual and progressive diminution of circulation-causing force in said pool in said one direction throughout the portion of said region extending to said one extremity from the central locality thereof.

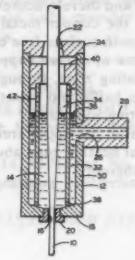
11. Continuous casting procedure comprising
a. supplying molten metal to a cooled mold having an open outlet end while
b. advancing the metal in one direction through and beyond the mold outlet end as an ingot having a solid outer shell and a central pool of molten metal cooperatively defining a solid-liquid interface that tapers inwardly in said one direction, and
c. causing, by application of stirring force created by a moving magnetic field in the path of ingot advance throughout a stirring region having upstream and downstream extremities spaced apart in said one direction, a circulating flow of molten metal within said pool that sweeps along said interface in a direction substantially parallel to said one direction, while
d. producing and maintaning said magnetic field, by exciting a coil disposed in surrounding relation to the path of ingot advance at said stirring region with alternating current supplied to have at least two different phases in longitudinally successive portions of the stirring region, as a field for creating stirring force, in said stirring region, that decreases gradually and progressively from a central locality of the stirring region to at least one extremity thereof over a distance, measured along the path of ingot advance, at least equal to the diameter of said coil.

3,995,679

CONTINUOUS CASTING APPARATUS, AND A METHOD OF CASTING

Joseph Bernard Brinkmann, Oxford, and Joseph Edward Byrnes, Fairfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,715
Int. Cl.² B22D 23/04, 11/00
U.S. Cl. 164—86 10 Claims



1. Apparatus for the continuous casting of metal comprising copper by passing a copper containing metal core member through a body of molten metal containing copper and thereby accreting and solidifying molten metal having a substantially smooth surface free of irregularities on the core member, comprising:
a. an enclosed crucible for the containment of molten metal containing copper having an entry port in a bottom wall thereof and an exit port in a top wall thereof for the passage of a copper containing metal core member through the enclosed crucible and molten metal contents thereof, and having a feed inlet in a side wall thereof for the introduction of molten metal containing copper into the crucible;
b. a baffle within the crucible extending from the crucible bottom to above the molten metal contents thereof defining and establishing an inner chamber enclosing the crucible entry port and exit port and a casting area about a copper containing metal core member moving through the crucible and its copper containing molten metal contents from the entry port to the exit port of the crucible and defining and establishing an outer chamber adjoining the feed inlet for the introduction of molten metal containing copper, said baffle having at least one opening adjacent its bottom for the passage of molten metal containing copper from the feed inlet through the outer chamber of the crucible to the inner chamber thereof; and
c. means communicating with the interior of said crucible for evacuating gas from the upper area of the outer chamber of the crucible above its contents of molten metal containing copper.

8. A method of continuously casting molten copper metal comprising passing a copper metal core member through a crucible containing molten metal and thereby accreting and solidifying the copper melt having a substantially smooth surface free of irregularities on the copper core member, comprising the steps of:
a. providing an enclosed crucible containing molten copper metal and having an entry port and an exit port for the passage of a copper metal core member through the crucible and molten copper metal contents thereof;
b. establishing in said crucible an interior casting zone of the molten copper metal through which the copper metal core member passes when moving from the entry port to the exit port through the crucible and its molten copper metal contents and a substantially concentrically disposed exterior heating zone of the molten copper metal

provided by an annular baffle extending from the bottom of the crucible to above the molten metal contents thereof and having a plurality of openings therein at its lower end for the movement of molten copper metal between said zones;

c. introducing molten copper metal into the upper portion of said exterior zone and maintaining both zones subtantially full;

d. passing a copper metal core member through the interior casting zone of the crucible and molten copper metal contents thereof and thereby accreting and solidifying the copper melt on the copper metal core member with a substantially smooth surface free of irregularities;

e. establishing a flow of molten copper metal downward in said exterior heating zone, through the openings in the lower end of the baffle and countercurrently upward in said interior casting zone; and

f. evacuating gas from the upper area of the concentrically disposed external heating zone above the molten copper metal contents thereof.

3,995,680

METHOD OF COOLING PISTON BLANK MOLDS

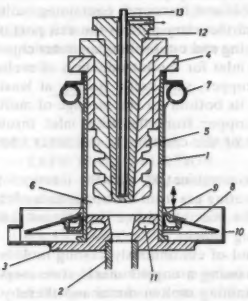
Adolf Diez, Bad Friedrichshall-Kochendorf, Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Germany

Division of Ser. No. 414,494, Nov. 9, 1973, Pat. No. 3,913,660. This application Apr. 8, 1975, Ser. No. 566,152

Claims priority, application Germany, Nov. 14, 1972, 2255644

Int. Cl.² B22D 27/04

U.S. Cl. 164—128 4 Claims



1. Process for casting piston blanks having a head end and a skirt end in a chill mold zone defined by stationary cylinder means having an inner core means reproducing the inner contours of the piston to be cast which comprises filling said chill mold zone from the piston head end of the zone with a melt comprising an aluminum alloy and thereafter cooling said chill mold zone progressively in a direction starting from the end of the piston skirt towards the piston head by spraying cooling water against the outer periphery of said cylinder means at the skirt end of the piston, said cooling water flowing downwardly forming a water curtain around said cylinder means.

3,995,681

APPARATUS FOR APPLYING FLUX POWDER TO THE BATH LEVEL IN A CONTINUOUS CASTING MOLD

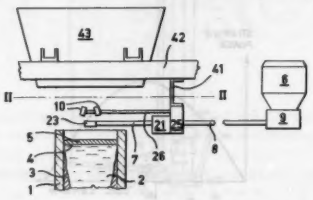
Markus Schmid, Zurich, and Werner Bruderer, Wattwil, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Division of Ser. No. 471,762, May 20, 1974. This application Feb. 28, 1975, Ser. No. 553,922

Claims priority, application Switzerland, May 30, 1973, 7799/73

Int. Cl.² B22D 11/00, 27/20

U.S. Cl. 164—154 4 Claims



4. An apparatus for depositing a casting agent, such as flux powder, to the bath level of liquid metal in a continuous casting mold during continuous casting, for monitoring the even distribution of a given layer thickness of said casting agent on said bath level of liquid metal, and for automatically correcting any deficiency in said distribution, comprising measuring means arranged above the bath level in the continuous casting mold for generating signals indicative of the thickness of the layer of casting agent, distributor means for the distribution of the casting agent onto the bath level, means connected to said distributor means for adjusting the position of the distributor means, regulator means for said distributor means for influencing the position of said distributor means and the quantity of casting agent delivered by said distributor means onto the bath level, means operatively connecting said regulator means with said adjusting means, first conductor means operatively connecting said measuring means with said regulator means, means for changing the conveyed quantity of casting agent, and second conductor means operatively connecting the regulator means with said means for changing the conveyed quantity of casting agent.

3,995,682

CONTINUOUS CASTING APPAKATUS WITH POUR TUBE HAVING LATERAL SLOT-LIKE OPENINGS

Kalman Fekete, Stafa; Walter Meier, Winterthur, and Ferdinand Fiala, Thalwil, all of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Apr. 26, 1974, Ser. No. 464,698

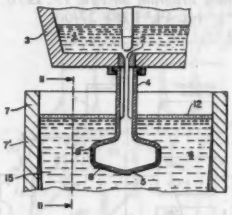
Claims priority, application Switzerland, May 7, 1973, 6417/73

Int. Cl.² B22D 11/10

U.S. Cl. 164—281 R 3 Claims

1. An apparatus for use during continuous casting for the introduction of a metal melt, especially a steel melt, into the casting head of a continuous casting mold having side walls, comprising a casting vessel equipped with an outlet, a substantially tubular-shaped portion directly merging with said casting vessel, said tubular-shaped portion having a cross-sectional area which is greater than the cross-sectional area of the outlet of the casting vessel, a substantially chamber-shaped portion of substantially larger cross-sectional area than the cross-sectional area of the tubular-shaped portion merging with said tubular-shaped portion, said chamber-shaped portion being equipped with a multiplicity of neighboring openings arranged at different substantially horizontal planes, said multiplicity of neighboring openings being arranged at the chamber-shaped portion such that the metal streams flowing

out of the openings flow in the direction of predetermined side walls of the mold and without the metal streams flowing out at each of said multiplicity of openings appreciably colliding with one another, the individual cross-sectional area of each opening being considerably smaller than the cross-sectional area or the tubular-shaped portion, said openings being of substantially laterally extending slot-like construction and having an internal width in the order of between 4 and 20 mm, said



slot-like openings being located beneath one another in vertical direction and having wide sides which serve as guide surfaces for the outflowing metal, said guide surfaces of at least one slot-like opening being inclined at an angle with respect to the horizontal, and said slot-like openings including an uppermost slot-like opening and a lowermost slot-like opening, at least the guide surfaces of the uppermost and lowermost slot-like openings being directed away from one another in the outflow direction.

3,995,683

CONTINUOUS CASTING APPARATUS

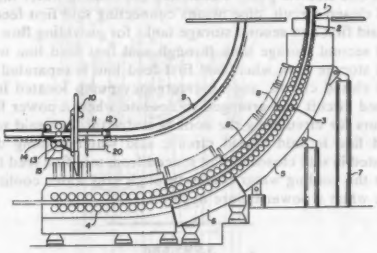
André Guyot, Thumeries, and Bernard Mulliez, Roubaix, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Apr. 7, 1975, Ser. No. 565,543

Claims priority, application France, Apr. 5, 1974, 74.12069; May 14, 1974, 74.16553

Int. Cl.² B22D *11/128*

U.S. Cl. 164—282 **10 Claims**



1. Continuous casting apparatus comprising:

a. an upright mold having a downwardly directed orifice for discharging a strand of cast metal;

b. guide rack means for guiding said strand in a first path downwardly away from said orifice, said guide rack means including two rows of rolls defining said path therebetween, said rolls having respective axes of rotation extending in a common horizontal direction;

c. a vehicle;

d. rail means for guiding said vehicle in a second path vertically spaced from said first path and substantially parallel thereto; and

e. hoisting means including

1. a track member mounted on said vehicle for pivotal movement about a pivoting axis extending parallel to the axes of the rolls in said common direction and for displacement in said common direction;

2. a slide member mounted on said track member for movement transverse to said common direction and having a face parallel to the direction of movement of said slide member and transverse to said paths,

3. moving means for moving a roll toward and away from said guide rack means in guiding engagement with said face of the slide member, and

4. actuating motor means for continuously moving said track member angularly about said pivoting axis and for displacing said track member in the direction of said pivoting axis.

3,995,684

APPARATUS FOR THE DIRECT COOLING OF A STRAND

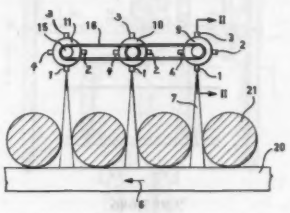
Markus Schmid, Zurich, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Mar. 14, 1975, Ser. No. 558,242

Claims priority, application Switzerland, Mar. 20, 1974, 3875/74

Int. Cl.² B22D *11/124;* **B05B** *3/18;* **C21D** *1/62*

U.S. Cl. 164—283 S **5 Claims**



1. An apparatus for the direct cooling of a continuously cast strand, especially a steel strand in a secondary cooling zone of a continuous casting machine, comprising spray nozzles for applying a cooling agent to a continuously cast strand moving in a predetermined direction of travel, holders supporting said spray nozzles, infeed means delivering the cooling agent to the spray nozzles, means for rotatably mounting each of said holders about a given axis of rotation, each said axis of rotation of said holders being substantially parallel to the surface of the strand which is to be cooled, each of said holders being provided with at least two of said spray nozzles, drive means for the stepwise rotation of said holders in groups, said rotatably mounting means mounting each of said holders such that at least one spray nozzle of each holder assumes a cooling agent-spray position confronting the strand surface so that cooling agent emanating from each such confronting spray nozzle impinges the strand surface at approximately a right angle, each other spray nozzle which is not in said cooling-agent spray position confronting the strand surface, being disconnected from said infeed means, said drive means selectively positioning, by stepwise rotation of said holders in groups, given spray nozzles in said cooling agent-spray position as a function of the required amount of cooling agent per unit area of the strand surface to be cooled and the required width of the strand surface area to be cooled.

3,995,685

FOUNDRY FLASK CLAMP

John J. Stanko, 327 Coraopolis Road, Coraopolis, Pa. 15108

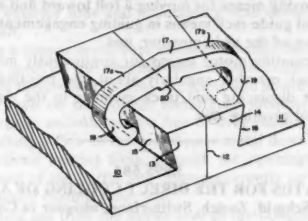
Filed May 19, 1975, Ser. No. 578,603

Int. Cl.² B22C *21/08*

U.S. Cl. 164—386 **4 Claims**

1. In combination a pair of foundry flask parts to be joined, one half of a V-shaped dove tail flange along each edge to be joined, integral with the flask, said flanges abutting one an-

other at the edges to be joined to form a generally flat surface across the two flanges, the adjacent flanges forming a V-shaped dove tail, a generally C-shaped clamp member having two legs extending from a center line at an obtuse angle to one another and having a jaw at each end adapted to slidably



engage the dove tail flange, saw jaws acting transversely on the dove tail surfaces of said flanges to urge them together and a central depending tongue on the C-shaped member beneath the center line adapted to bear on the two adjacent flanges at their juncture.

3,995,686

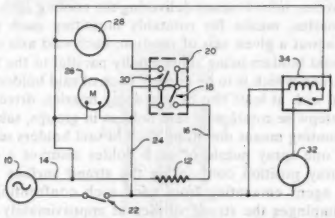
ENERGY CONSUMPTION INDICATING SYSTEM

Herbert L. Laube, 120 Windcrest Drive, Camillus, N.Y. 13031

Filed June 5, 1975, Ser. No. 583,952

Int. Cl.² G01K *17/06*

U.S. Cl. 165—11 **10 Claims**



1. A system for indicating relative amounts of energy consumed for comfort temperature control by individual occupancy units of a multi-unit structure wherein the actual total energy use is metered for the entire structure, said system comprising:

a. a plurality of temperature control units, each associated with one of the individual occupancy units to alter the temperature of room air therein, and all operated from a common energy source;

b. a control switch associated with each of said temperature control units, the latter being operable by energy from the common source to alter room air temperature in accordance with the selective setting of said control switch;

c. an electrically operated elapsed time meter associated with each of said temperature control units; and

d. means for actuating said meter to indicate the elapsed time of operation of its associated temperature control unit to alter room air temperature.

3,995,687

WATER COOLING SYSTEM FOR A SHAFT TYPE FURNACE

Horst Euler, Rumeln-Kaldenhausen, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

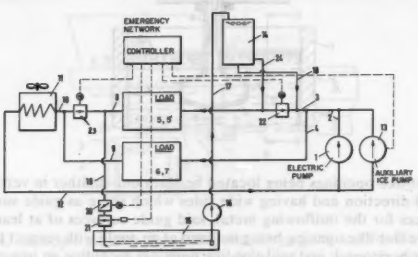
Filed Jan. 22, 1975, Ser. No. 543,078

Claims priority, application Germany, Jan. 26, 1974, 2403741

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² F28F *27/00*

U.S. Cl. 165—13 **9 Claims**



1. In a water cooling system for shaft furnaces, such as blast furnaces, comprising a closed circuit, a water cooling device located in said closed circuit, a first storage tank located below said closed circuit, at least one electric pump located in said closed circuit for circulating the cooling water, a second storage tank located above said closed circuit, and a pipe connecting said second storage tank to said closed circuit for maintaining a constant water pressure in said closed circuit, wherein the improvement comprises that said closed circuit includes a first feed line for cooling one portion of the shaft furnace and a second feed line disposed in parallel with said first feed line for cooling another portion of the shaft furnace, valve means in said first feed line for separating it from the flow through said closed circuit and said valve means arranged to operate automatically in a power failure affecting said at least one electric pump circulating the cooling water through said closed circuit, pipe means connecting said first feed line to said first and second storage tanks for providing flow from said second storage tank through said first feed line to said first storage tank when said first feed line is separated from said closed circuit, and an emergency pump located in said closed circuit and arranged to operate when a power failure occurs for circulating the cooling water through said second feed line in said closed circuit, said water cooling device located in said closed circuit spaced from said first feed line so that the cooling water passes through said water cooling device when a power failure occurs.

3,995,688

AIR-TO-AIR HEAT EXCHANGER

William J. Darm, Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 31,092, April 23, 1970, abandoned, Division of Ser. No. 468,659, May 10, 1974, Pat. No. 3,905,850. This application May 12, 1975, Ser. No. 576,686

Int. Cl.² F28D *9/02*; F28F *3/00*

U.S. Cl. 165—165 **6 Claims**

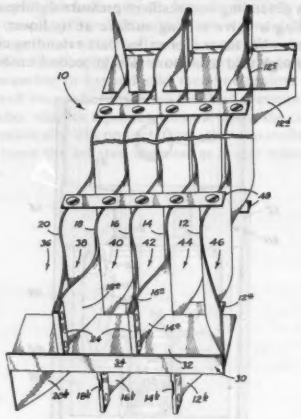
1. A heat exchanger apparatus comprising:

a housing;

a plurality of heat exchanger plates within said housing defining a plurality of fluid channels disposed side-by-side between said plates;

a plurality of spacer means extending across the longitudinal edges of said plates and fixedly attached to said edges to space said plates apart and to secure said plates;

a plurality of fastening means for joining the opposite ends of the exchanger plates to the ends of other exchanger plates adjacent thereto, at least some of said plates having ends divided into two end portions which are joined to



different exchanger plates on opposite sides thereof to form two separate sets of channels; and

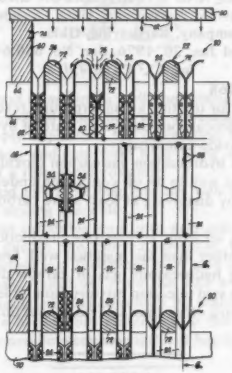
sealing means including synthetic plastic material bonded to the longitudinal edges of said plates including portions of their joined ends to seal said channels.

3,995,689

AIR COOLED ATMOSPHERIC HEAT EXCHANGER

Robert E. Cates, Leawood, Kans., assignor to The Marley Cooling Tower Company, Mission, Kans.

Filed Jan. 27, 1975, Ser. No. 544,648
Int. Cl.² F28F *3/04, 3/08*
U.S. Cl. 165—166 **19 Claims**



1. Water cooling apparatus comprising:

a distributor adapted to receive and distribute initially hot quantities of water; and

essentially indirect heat exchange means comprising a plurality of open top and bottom water conveying structures disposed beneath said distributor with air passages therebetween oriented for passage of cooling air therethrough in indirect heat exchange relationship to water gravitating through the structures,

each of said structures having performed, shape retaining spaced, opposed sidewalls of relatively thin synthetic resin sheet material configured to present a series of tortuous water flow paths leading generally from the top of said structures to the bottom thereof,

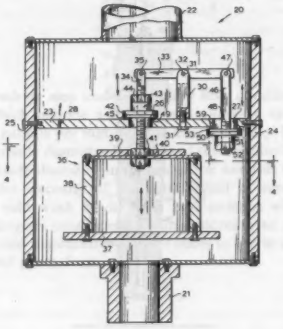
the open tops and lower open bottoms of the structures being exposed to the atmosphere to allow siphonic entrainment of air in the water as it flows from said tops of the structure to the open bottoms thereof.

3,995,690

WELL POINT SYSTEM

Joseph M. Valdespino, Orlando, Fla., assignor to R. L. Gould and Stanley Hobbs, both of Winter Park, Fla., part interest to each

Filed Feb. 26, 1976, Ser. No. 661,831
Int. Cl.² E21B *43/00*
U.S. Cl. 166—52 **21 Claims**



1. A well point system comprising in combination: pumping means;

a plurality of well points;

a plurality of risers attached to said well points for connecting each said well point to said pumping means;

a plurality of valves for substantially cutting off individual risers in the absent of the flow of water, each said valve having a casing having an opening in each end thereof and each said valve having a wall located in said casing between said openings in each end thereof and mounted to said casing, each said valve having a float actuated arm movably mounted inside said casing and a float located on one side of said wall and mounted to said float actuated mechanism, said valve also having a plurality of valve members mounted to said float actuated mechanism adapted to cover a plurality of openings through said wall in one position and to open a plurality of openings in said wall in a second position whereby moving said float actuated mechanism by said float will open and close said valve to the flow of water through said wall; and

air bleed means for allowing air to escape through said wall whereby said air bleed allows sufficient pressure to lift water in a riser to actuate said valve.

3,995,691

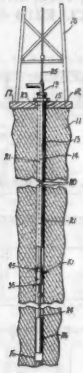
TOOL FOR CONTROLLING FLUID FLOW AT REMOTE LOCATIONS

Floyd R. Hedgecock, 800 E. Polk St., and Andrew J. Trent, 232 Washington St., both of, Coalinga, Calif. 93210

Filed Sept. 8, 1975, Ser. No. 611,063
Int. Cl.² E21B *43/00*
U.S. Cl. 166—105 **16 Claims**

1. A tool for controlling the flow of fluid through a conduit at a remote location, the tool comprising a valve assembly having first and second components interconnected for move-

ment relative to each other wherein the first component has a coupling at one end thereof for connection in fluid transferring relation to the conduit, the components having first passages extending therethrough to establish fluid communication within the conduit through the valve assembly and the first component having an opposite end with an opening for discharge of fluid from the valve assembly with the second component received for reciprocal movement within the first component extending through said discharge opening and said first component having a second passage by-passing a portion of the first passage of the first component and communicating with said discharge opening when said components are disposed in predetermined positions relative to each other; sealing means mounted on the second component for movement



with said second component between a retracted position in which said sealing means seals the discharge opening of the first component and a discharge position in which said sealing means directs fluid through the second passage and opens the discharge opening; and an enclosure mounted on the first component through which the second passage extends communicating with the first passage of the first component through a pair of spaced openings and the discharge position of the second component positions the sealing means between said spaced openings whereby fluid is directed from the first passage of the first component into the second passage circumventing the sealing means and back into the first passage of the first component for discharge from the valve assembly through the discharge opening.

3,995,692

CONTINUOUS ORIFICE FILL DEVICE

Peter W. Seitz, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

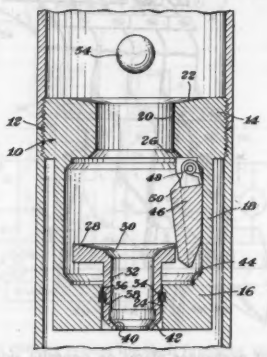
Filed July 26, 1974, Ser. No. 492,120

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.[2] E21B *41/00*

U.S. Cl. 166—318 **6 Claims**

1. A continuous orifice fill device comprising a disc-like cross member having edge coupling means for attaching it in a sealing relationship around the inner wall of a string of casing, said cross member having a top which is beveled towards the center of said cross member, an axial bore extending through said cross member, and a bottom part including a flapper valve assembly including a valve seat surrounding said axial bore and a hinged flapper valve, a second cross member, said second cross member being disposed below said first cross member and coupled and sealed with respect to said first cross member by tubular walls which are disposed within said string of casing, said second cross member having an axial bore extending therethrough, a movable metal valve seat member having an upper position and a lower position, said valve seat member having a tubular walled part having an upper end including an outwardly extending flanged part and an inwardly extending non-resilient pressure deformable valve seat including a valve seating surface at its lower end, said valve seat member having its walled part extending closely but slidably through said axial bore in said second cross member



whereby its outwardly extending flanged part retains said hinged flapper valve in an open position when said valve seat member is in its upper position, means for maintaining said valve seat member in its upper position until a predetermined pressure is reached on said pressure deformable valve seat, said axial bore of said first cross member and said tubular walled part of said valve seat member being dimensioned to permit a valve element to pass through and seal against said inwardly extending pressure deformable valve seat.

3,995,693

RESERVOIR TREATMENT BY INJECTING MIXTURE OF CO_2 AND HYDROCARBON GAS

Archie J. Cornelius, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1976, Ser. No. 650,648

Int. Cl.[2] E21B *43/18*

U.S. Cl. 166—268 **12 Claims**

1. A method for treating an underground reservoir containing residual hydrocarbons using a mixture of hydrocarbon gas and carbon dioxide comprising:

a. injecting a hydrocarbon gas-carbon dioxide mixture into at least one well in an oil containing underground reservoir thereby dissolving at least some carbon dioxide into said oil;

b. producing oil from at least one production well in said reservoir other than the injection well; and

c. producing hydrocarbon gas of carbon dioxide content lower than said injection mixture from at least one well in said reservoir other than said oil production and injection wells.

3,995,694

INFLATABLE WELL SEAL AND METHOD OF USE THEREOF

Cletus N. Freiburger, 2820 Davenport St., Dubuque, Iowa 52001

Filed Nov. 4, 1975, Ser. No. 628,750

Int. Cl.[2] E21B *33/13*, *33/127*; **F16K** *17/40*

U.S. Cl. 166—285 **11 Claims**

1. An apparatus for forming a seal within the wall of a well bore which comprises:

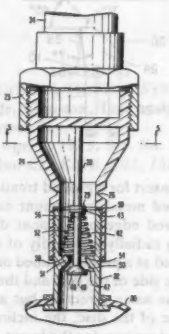
an expansible hollow member,

a normally closed valve attached to one end of said expansible member,

a coupling releasably mounted on said valve and having means provided therein to hold the valve in an open position,

said coupling including means for automatically disengaging said coupling from said valve when a predetermined fluid pressure is accumulated in said expansible member, and

means for conducting a fluid under pressure to the expansible member to expand said member against the wall of the well bore, whereby when the fluid pressure within said member reaches a predetermined value, the coupling will automatically disconnect from the expansible member and leave the inflated member as a seal within said well bore.



11. A method of sealing a well comprising the steps of:

connecting a fluid hose between an inflatable bag and a fluid supply apparatus, the connection between said inflatable bag and said fluid hose being accomplished by means of a releasable coupling;

lowering said inflatable bag into the well to a depth sufficient for sealing the well;

inflating said inflatable bag until said releasable coupling releases due to the internal pressure therein, thereby disconnecting said fluid hose from said inflatable bag;

removing said fluid hose from the well while maintaining said bag in an inflated condition for sealing said well; and

depositing a hardenable material into the well to fill the cavity formed between said inflated bag and ground level.

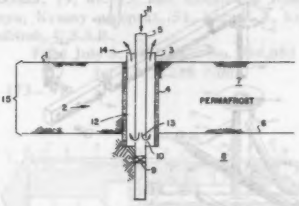
3,995,695

METHOD FOR COMPLETING A WELL IN A PERMAFROST ZONE

Thomas K. Perkins, Dallas, Tex., and Frederick W. Ng, Anchorage, Alaska, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 25, 1975, Ser. No. 607,147
Int. Cl.² E21B *43/00*
U.S. Cl. 166—302 **8 Claims**

1. In a method for completing a well having a conduit therein for passing fluid from the earth's surface into the interior of the well, said well and conduit passing through a permafrost zone, there being at least one pipe annulus outside said conduit and in the permafrost zone of said well, said annulus containing an at least partially freezable liquid which will expand in volume upon cooling to the in situ temperature of said permafrost, the improvement comprising washing said freezable liquid from said annulus using from about one-quarter to about four system volumes of a wash liquid that has a base liquid of the same class as said freezable liquid, carrying



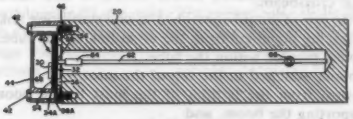
out said washing step under turbulent flow conditions in each annulus which include a wash liquid pumping rate into said conduit in gallons per minute of at least $1.16\ (D_o+D_i)\mu$, where D_o is the outside diameter in inches of the annulus in question, D_i is the inside diameter in inches of the annulus in question, and μ is the viscosity of the wash liquid in centipoise and displacing said wash liquid from said annulus with a liquid which undergoes insufficient volume increase to damage the well when said displacement liquid cools to the in situ temperature of said permafrost.

3,995,696

CAPACITANCE TRANSDUCER LOAD SENSOR

Carl Edward Kainer, and Gordon K. Wiegardt, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 10, 1975, Ser. No. 548,584
Int. Cl.² A01B *61/04*
U.S. Cl. 172—7 **14 Claims**



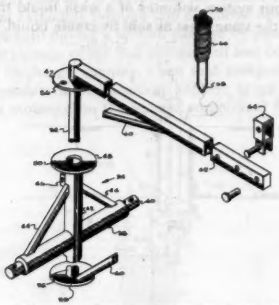
1. In a draft control system for controlling the movement of the draft links of an agricultural tractor in response to strain on a draft link, a load sensor comprising: a capacitance transducer having first and second stationary capacitor plates secured to one of the draft links in fixed, parallel, and spaced positions with respect to each other, said transducer including a movable capacitor plate spaced from and interposed between the stationary plates to form, in cooperation therewith, two capacitors; and means for securing the movable plate to the one of the draft links at a point remote from the securement between the stationary plates and the one of the draft links whereby deformation of the one of the draft links between the point of securement of the movable plate to the one of the draft links and the point of securement between the stationary plates and the one of the draft links moves the movable plate relative to the stationary plates to change capacitance values of the capacitors in proportion to the deformation.

3,995,697

WEIGHT TRANSFER UNIT

Dickie D. Fellers, Rte. 1, Hereford, Tex. 79045

Filed Aug. 4, 1975, Ser. No. 601,654
Int. Cl.² A01B 59/043, 63/00
U.S. Cl. 172—440 6 Claims



1. In a tractor with a tillage implement,
a. the tractor having
b. rear traction wheels,
c. front steerable wheels,
d. a draw bar, and
e. a three-point power and draft linkage including
i. two lift links,
ii. power means interconnecting the tractor and links for raising and lowering the lift links, and
iii. a stabilizing link for stabilizing a mechanism attached to the three-point linkage, and
f. the tillage implement having
g. a center of gravity, and
h. a tongue pinned to said draw bar by
j. a draw pin;
k. THE IMPROVED STRUCTURE IN COMBINATION WITH THE ABOVE COMPRISING:
m. a tube frame having
i. a horizontal crossbeam
ii. connected to each end of said lift links,
iii. an upright tube having an axis attached to the horizontal crossbeam,
iv. the top of the tube attached to said stabilizing link, and
v. bracing members from the cross link to the tube,
n. a mast pivoted within the tube,
o. a boom attached to the top of the mast,
p. a strut from the bottom of the mast to the boom for supporting the boom, and
q. a spring attached from near the end of the boom to the tillage implement at the center of gravity of the tillage implement.

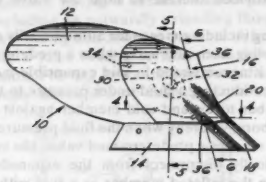
3,995,698

PLOW MOLDBOARD GUARD

Tom Holland Nelson, R.F.D. No. 4, Box 398, and Bruce Cooper Nelson, R.F.D. No. 4, Box 397, both of Berlin, Md. 21811

Filed July 11, 1975, Ser. No. 594,963
Int. Cl.² A01B 17/00, 15/10
U.S. Cl. 172—719 17 Claims

1. A plow including a moldboard member and a shin member, said shin member having a thicker forward section and a thinner rearward section forming a shoulder on the non-working back side of the shin member at the juncture of the two sections, said shin member being mounted with respect to the moldboard member such that the shoulder of the shin member abuts the leading edge of the moldboard member and the



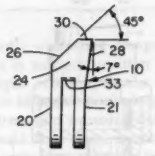
rearward section of the shin member overlies the working face of the moldboard member.

3,995,699

REPLACEABLE INSERT FOR AGRICULTURAL DISC

Joseph T. Blucher, Waltham, and Ernest A. Evancic, Fitchburg, both of Mass., assignors to Wallace-Murray Corporation, Fitchburg, Mass.

Filed Dec. 11, 1975, Ser. No. 639,601
Int. Cl.² A01B 15/16, 23/02
U.S. Cl. 172—719 5 Claims



1. A replaceable insert for a ground treating disc comprising an inverted U-shaped metal investment casting which when fitted over the curved edge of a planar disc has plane side surfaces converging radially outwardly of said disc, one side surface being inclined at a predetermined angle to the plane of the disc towards one side of the disc and the other side surface being inclined in the same direction but at a different angle relative to the plane of the disc, the inclinations of said side surfaces providing clearance for the insert on one side of said disc and reducing the areas of the end faces of the insert on the other side of said disc to reduce resistance to passage of said insert through the ground, thereby furnishing a furrow-making tool for said disc.

3,995,700

HYDRAULIC ROCK DRILL SYSTEM

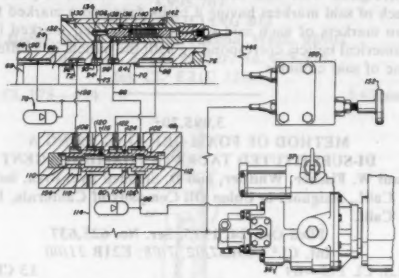
James R. Mayer, and Dieter K. Palauro, both of Denver, Colo., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Oct. 14, 1975, Ser. No. 621,935
Int. Cl.² E21C 3/20
U.S. Cl. 173—2 17 Claims

1. A hydraulic rock drill system comprising:
a source of hydraulic pressure fluid;
a hydraulic pressure fluid actuated percussion rock drill operable to be in communication with said source and including;
a. a casing having a cylinder bore;
b. an impact receiving member;
c. a pressure fluid reciprocable piston hammer disposed in said bore and responsive to pressure fluid acting thereon to transmit impact blows to said member;
d. a fluid distributing valve adapted for reciprocating movement in response to pressure fluid acting thereon for controlling the flow of pressure fluid to and from said bore to effect reciprocation of said hammer; and,

e. a conduit in communication with said bore for conducting pressure fluid to effect reciprocation of said valve;

first means associated with said conduit for controlling the fluid pressure therein whereby the movement of said



distributing valve may be controlled to vary the impact blow energy transmitted to said impact receiving member by said hammer; and,

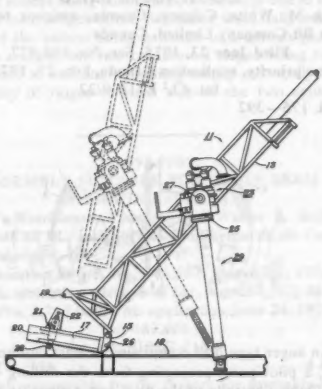
second means providing for remote control of said first means to control the movement of said distributing valve.

3,995,701

DERRICK TILTING SYSTEM

Joseph L. Kelly, Jr., Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 7, 1975, Ser. No. 565,991
Int. Cl.² E21B *3/02, 15/00*
U.S. Cl. 173—43 5 Claims



1. An improved earth boring machine of the type having a base, a mast pivotally secured to the base, a drilling assembly reciprocally carried by the mast, hydraulic means to move the assembly along the mast, and a power swivel pivotally carried by said assembly, the improvement comprising:

a screw jack assembly pivotally connected at one end to the base; and

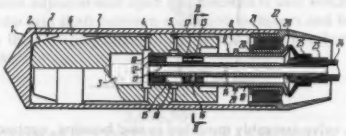
coupling means for coupling the other end of the screw jack assembly to the power swivel for rotational movement therewith while the mast is being positioned at a selected angle with respect to the base; said coupling means being releasble for drill pipe connection to the power swivel after the mast is positioned at the selected angle.

3,995,702

REVERSIBLE PNEUMATIC PERCUSSIVE DEVICE FOR MAKING HOLES IN GROUND BY COMPACTION

Vladimir Vasilievich Klimashko, ulitsa Novogodnaya, 44, kv. 24; Khaim Berkovich Tkach, ulitsa Gogolya, 17, kv. 49; Vladimir Maximovich Terin, Mochischensky spusk, 68; Boris Nikolaevich Smolyanitsky, ulitsa Oleko Dundicha, 27, kv. 18; Boris Vasilievich Sudnishnikov, Krasny prospekt, 56, kv. 59; Veniamin Viktorovich Kamensky, ulitsa Derzhavina, 19, kv. 78; Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 13, and Konstantin Konstantinovich Tupitsyn, Krasny prospekt, 51, korpus 3, kv. 25, all of Novosibirsk, U.S.S.R.

Filed July 8, 1975, Ser. No. 594,055
Int. Cl.² E21B *1/00*
U.S. Cl. 173—91 4 Claims



1. A reversible pneumatic percussive device for making holes in ground by compaction of the latter, comprising: a cylindrical housing pointed in the front portion thereof; a striker having lateral passages and a space open from the rear end face arranged in said housing and dividing the inner space of said housing into front and rear chambers and reciprocating under the action of compressed air supplied periodically to said chambers, said striker striking said housing in the course of said reciprocations; an air distributing branch connection for supplying compressed air to said chambers and threaded in said housing to be axially displaceable therein for reversing motion of said device and being arranged in the space of said striker, said branch having two coaxial pipes with an inner pipe forming a first longitudinal passage in constant communication with a compressed air source and serving to periodically supply air to the front chamber through the space and lateral passages of said striker, the annular space between said pipes being a second longitudinal passage in constant communication with the atmosphere; said air distributing branch connection having a lateral passage connected to the first longitudinal passage for periodically admitting air to said rear chamber, and a second lateral passage connected to said second longitudinal passage for periodically communicating via the lateral passages of said striker the second longitudinal passage with said chambers to exhaust air to the atmosphere therefrom.

3,995,703

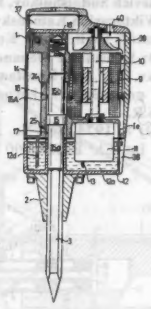
ELECTROHYDRAULICALLY OPERATED PORTABLE POWER TOOL

Karl Wanner, Echterdingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 5, 1975, Ser. No. 574,715
Claims priority, application Germany, May 20, 1974, 2424391
Int. Cl.² B25D *9/00*
U.S. Cl. 173—105 24 Claims

5. A portable power tool, particularly an impact type power tool, comprising a hollow housing; holder means carried by said housing and arranged to receive a tool which can perform reciprocating movements with respect thereto; a hydraulic pump and a prime mover for said pump mounted in said housing; a receptacle provided in said housing and arranged to contain a supply of hydraulic fluid for said pump; hydraulic motor means mounted in said housing, driven by pressurized fluid supplied by said pump, and arranged to impart move-

ments to the tool in said holder, said motor means comprising a double-acting cylinder, a piston reciprocable in and dividing the interior of said cylinder into first and second chambers, and an output element rigid with said piston and arranged to strike against the tool in said holder means during movement of said piston in a first direction with respect to said cylinder;



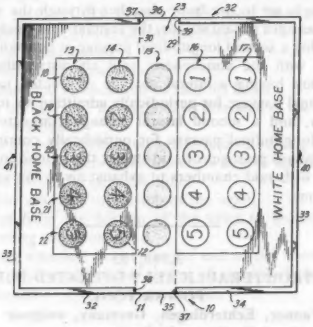
and a valve assembly mounted in said housing, connected with said pump and operative to alternately admit pressurized fluid into said first and second chambers and to thereby effect alternating movements of said piston in said first direction and in a second direction counter to said first direction, and a reciprocable valve member.

3,995,704

BOARD GAME APPARATUS

Bernard Blickman, 115 Central Park West, New York, N.Y. 10023

Filed Nov. 6, 1975, Ser. No. 629,278
Int. Cl.² A63F *3/00*
U.S. Cl. 273—131 B **4 Claims**



1. A game apparatus comprising a game board including an upper face having a substantially square play area having five transversely extending, longitudinally displaced rows, each said row incorporating five transversely spaced apart landing areas, said landing areas being also aligned in a longitudinal direction to define five longitudinally extending columns, the landing areas within each of the first, second, fourth and fifth rows bearing numerical indicia of values differing from each other, the values of the indicia being constant within each said column, the landing areas in said first and second rows defining a first territory and being of a first color differing from the color of the landing areas of said third row, and the landing areas of said fourth and fifth rows defining a second territory and being of a second color distinguishable from said first color and the color of said landing areas of said third row, the combination including first and second sets of ten markers each, said markers being opaque and having flat parallel upper and lower faces, said first and second sets being colored to correspond with said first and second colors, respectively, each of said markers having a blank face and a marked face, two markers of each said set bearing on their marked faces numerical indicia corresponding with the indicia in a different one of said columns.

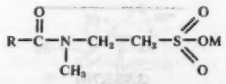
3,995,705

METHOD OF FOAM DRILLING USING A DI-SUBSTITUTED TAURATE FOAMING AGENT

Paul W. Fischer, Whittier, and D. Stephen Pye, Brea, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 24, 1975, Ser. No. 625,637
Int. Cl.² C09K *7/02, 7/08;* **E21B** *21/00*
U.S. Cl. 175—69 **13 Claims**

1. In the method of conducting foam drilling and workover operations in a bore hole penetrating a subterranean formation, wherein foam is generated by contacting an aqueous solution of a foaming agent with a gas, and said foam is caused to flow upwardly through the bore hole carrying solid and liquid materials out of the bore hole, the improvement which comprises using a foaming agent having the formula:



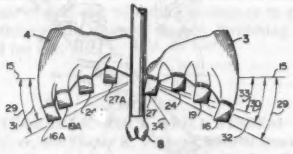
wherein R is a straight chain alkyl group having from 9 to 15 carbon atoms; and M is an alkali metal or ammonium cation.

3,995,706

EARTH AUGER DRILL

Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company Limited, Canada

Filed June 23, 1975, Ser. No. 589,077
Claims priority, application Canada, Feb. 27, 1975, 220881
Int. Cl.² E21B *9/22*
U.S. Cl. 175—392 **4 Claims**



1. An auger type drill comprising at least two helical auger flights, a pilot point projecting from the drilling end of the auger flights centrally of the drill, and a plurality of teeth on the drilling ends of each of the auger flights, each of said teeth projecting at an angle downwardly and in the direction of rotation of the drill for drilling, the outermost tooth in each plurality being at the peripheral edge of the corresponding auger flight which defines the radius of the hole to be drilled by the drill and being at a level with respect to the pilot point which is above the pilot point with respect to drilling in the downward direction, the next adjacent tooth in each plurality being above the level of the outermost tooth and circumferentially rearwardly, with respect to the direction of rotation of the drill during drilling, of a radial reference line on which the tip of the outermost tooth lies, and the innermost tooth in each plurality being above the level of the outermost tooth and

having the tip thereof positioned no further circumferentially rearwardly with respect to the outermost tooth than said radial reference line.

3,995,707

WELL DRILLING BIT

John Herke, Rte. 5, Box 375, Yakima, Wash. 98902

Filed Sept. 23, 1975, Ser. No. 615,975
Int. Cl.² E21C 13/08
U.S. Cl. 175—414 3 Claims

1. A well drilling bit adapted to be cyclically lifted and lowered to drill through an earth formation comprising an elongated vertical body having a lower outwardly flared end having a cutting face thereon for engagement with the earth formation, said cutting face being generally circular in configuration and having a plurality of parallel alternately arranged ridges and valleys extending transversely thereof and occupying substantially the entire area thereof, each of said ridges and valleys being disposed in a single vertical plane and having a constant cross-sectional dimension from end to end, said ridges and valleys being concavely curved from end to end and the axially outer edges of the ridges and the axially innermost surfaces of the valleys being oriented in a convex pattern in transverse section, the two centermost ridges being continuous from end to end and extending axially outwardly beyond the plurality of ridges to each side of the two centermost ridges.

3,995,708

KNOB ASSEMBLY SUITABLE FOR USE IN BEAM TYPE WEIGHING SCALES

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Bridgeview, Ill.

Continuation of Ser. No. 343,502, March 21, 1973, abandoned, which is a division of Ser. No. 254,767, May 18, 1971, Pat. No. 3,743,040. This application June 24, 1974, Ser. No. 482,086
Int. Cl.² G01G 21/00
U.S. Cl. 177—126 4 Claims

1. A knob engageable by the fingers for assembly onto a shaft having a pair of opposing notches adjacent an end thereof, comprising a pair of knob members, each having an outer face and an inner face, the inner faces of each said knob members having a central channel open at the same end and adapted to receive the end of said shaft at said open end, each of said inner faces having an inwardly projecting portion adjacent said open end of said channel to receive one of said opposing notches of said shaft, said inner face of each said knob member also having a reentrant portion on each side of said channel, at least one of said reentrant portions containing a projecting portion with a recess therein, the opposing reentrant portion containing a projecting portion adapted to fit into said last named recess, said reentrant projecting portions and said recessed reentrant projecting portions being complemental to one another when the inner faces of said members are facing each other so that said members can be snapped together over the end of said shaft with said inwardly project-

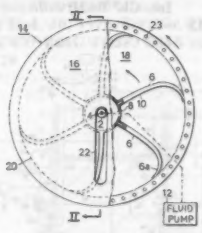
ing portions adjacent said open end inserted in said notches so as to clamp said shaft between said knob members and hold it solely by the clamping engagement of said knob members and said shaft.

3,995,709

AUTOMATIC CONTINUOUS TRANSMISSION

Jacob Gil, Deganiot St. 24, Tivon, Israel

Filed Sept. 30, 1975, Ser. No. 618,282
Claims priority, application Israel, Oct. 20, 1974, 45881
Int. Cl.² B60K 17/00
U.S. Cl. 180—70 R 11 Claims



1. A variable-diameter power-transmission device comprising a rotatable member, and a plurality of arms attached at their inner ends to the rotatable member and extending outwardly therefrom in a radial direction, said arms being curved at their outer ends in a circumferential direction to provide a generally cylindrical coupling surface for coupling to another device, said arms being flexible permitting them to flex with respect to the rotatable member to change the radial distance of the outer end of the arms from their inner ends, and thereby to change the effective diameter of said coupling surface.

3,995,710

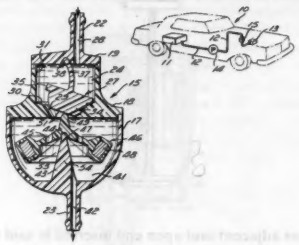
TILT-RESPONSIVE VALVE

Louis B. Courtot, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 4, 1975, Ser. No. 565,005
Int. Cl.² F16K 17/36
U.S. Cl. 180—104 8 Claims

1. A tilt-responsive valve comprising a valve body, a check valve within the body, said valve including an annular valve seat and a valve seat closure member, means biasing said closure member towards a closed position, said biasing means including means to develop an axial force on said closure member towards said annular seat, a valve control pendulum in said body, control means associated with said pendulum for maintaining said closure member in an open position when

said valve body is substantially upright or within a normal range of inclination from a substantially upright position and for permitting said biasing means to close said closure member when said valve body is tilted from an upright position beyond said range of normal inclination, said control means comprising an integral extension of said pendulum above a pivot center of said pendulum, said pendulum and said valving member being disposed on opposite sides of said annular valve seat, said closure member and said biasing means being integrally formed of elastomeric material.



3,995,711

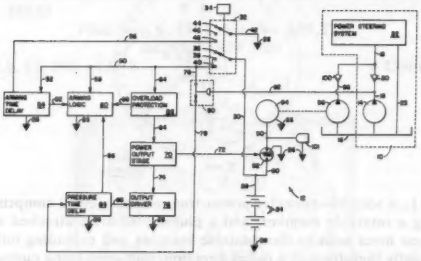
VEHICLE POWER STEERING ELECTRO-HYDRAULIC SAFETY BACKUP SYSTEM

Carl Edwin Kittle, and Gordon K. Wiegardt, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 18, 1976, Ser. No. 668,224

Int. Cl.² B62D 5/06

U.S. Cl. 180—133 8 Claims



1. In a vehicle having a main power steering system and a hydraulic system including a source of pressurized fluid fluidly connected by a main line to the main power steering system, said vehicle further having an electrical system including a source of electrical energy having first and second potentials, an electrohydraulic emergency power steering system comprising: an auxiliary source of pressurized fluid fluidly connected to the main power steering system; an electrically responsive drive means connected to and energizable for driving said auxiliary source of pressurized fluid; an ignition switch connected to the source and having off, ignition, and arm contacts operable to connect the first potential to the off contact in an off position, to connect the first potential to the ignition contact in an ignition position, and to connect the first potential to the ignition contact and the second potential to the arm contact in a start position; normally closed pressure switch means connected to the ignition contact and fluidly connected to the main line responsive to a predetermined fluid pressure in the main line to open said pressure switch means; pressure means connected to the pressure switch means responsive to the connection of the first potential to the ignition contact and a closed pressure switch means to provide an output signal; arming means connected to the ignition and arm contacts responsive to the connection of the first potential to the ignition contact and the second potential to the arm contact to provide an arm signal; logic means connected to the ignition contact, the arming means, the pressure means, and the second potential responsive sequentially to the connection of the first potential to the ignition contact to connect the output signal to the second potential, to the connection of the first potential to the ignition contact and the second potential to the arm contact to connect the output signal to the second potential, to the arm signal to connect the output signal to the second potential, and to the absence of the arm signal to block the output signal from the second potential; and output means connected to the electrically responsive drive means, the pressure means, and the ignition contact responsive to the blocking of the output signal from the second potential to connect the first potential through the ignition contact to the electrically responsive drive means.

3,995,712

MUFFLER

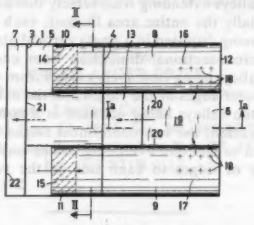
Hans Karl Leistritz, Kussaberg, Germany, and Hans Thoma, Neuhausen am Rheinfall, Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Aug. 30, 1974, Ser. No. 502,078

Claims priority, application Germany, Sept. 3, 1973, 2344351

Int. Cl.² F01N 1/08

U.S. Cl. 181—53 5 Claims



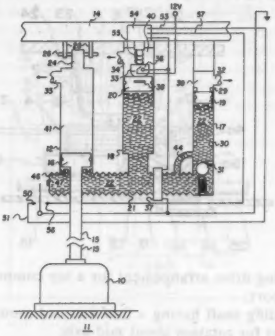
1. A muffler for an exhaust system of an internal combustion engine, a pneumatic tool and the like, comprising a casing containing at least two spaced parallel conduction channels comprising pipe elements extending in a downstream direction from an entrance chamber provided in said casing for the sound-carrying gas stream of the exhaust system, each said channel having a conducting device mounted therein adjacent said entrance chamber and extending a short distance downstream of said channels, each said device having means for applying a torque to the partial flow of the entering gas about the longitudinal axis of each said channel, each said channel being free of any components along the remainder of its length, and a separate gas collecting chamber in said casing located between said pipe elements at their downstream ends, means closing said pipe elements at said downstream ends, and means adjacent said ends comprising through openings in said pipe elements and facing each other and opening into the gas collecting chamber to permit the partial gas flows therein to unite from opposite directions and to thereafter flow together into a common outlet chamber provided for the system, a third pipe element being located between said conduction channels, said third pipe extending through said entrance chamber and opening into said collecting chamber and an outlet chamber respectively at its opposite ends for draining the united partial gas flows from said collecting chamber.

3,995,713

HIGH SPEED SEISMIC GAS EXPLODER AND METHOD OF OPERATION

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 526,842
Int. Cl.² G01V 1/02, 1/10
U.S. Cl. 181—119 12 Claims



1. An apparatus for controlling the rise and fall of a seismic gas exploder of the type adapted to apply a downwardly directed pulse to the earth and which is driven upwardly by the resultant reactive force comprising:

a. a support structure,

b. at least one hydraulic cylinder affixed to said support structure and having a piston movable therein,

c. means for coupling said gas exploder to said piston so that said piston and said gas exploder are constrained to move together, and

d. means for selectively damping the motion of said piston so that an initial portion of the fall of said exploder is unrestrained and a terminal portion of said fall is restrained and such that said initial portion of the fall of said exploder is of substantially greater length than said terminal portion.

3,995,714

MULTI-SECTION LADDER FOR SCALING POLES

Malcolm J. Brookes, 30 E. 68th St., New York, N.Y. 10021; James A. Sheridan, Box 295-A, Rte. 1, Englishtown, N.J. 07726, and Douglas M. Spranger, 23 Fiske Place, Brooklyn, N.Y. 11215

Filed Nov. 17, 1975, Ser. No. 632,707
Int. Cl.² E06C 1/10, 7/48
U.S. Cl. 182—100 13 Claims

1. A portable, multi-section ladder for scaling poles, said ladder comprising a main section having at least one extension section linked thereto, each section having a vertical spar and a series of steps mounted thereon at spaced positions, the upper end of the main section being provided with a tiltable open-loop assembly adapted to engage a pole to be scaled and to harness this section thereto when a downward force is exerted thereon, the lower end of each section terminating in a coupling head, a latching piece attached to the upper end of the extension sections adapted to engage the coupling head in the section thereabove, whereby the main section and the extension sections may be interlinked, said open-loop assembly being constituted by a block hinged to the upper end of the spar of the main section, a crook-shaped arm secured to the free end of the block and extending forwardly therefrom to embrace one side of the pole, and a yoke mounted on a stub arm secured to the free end of the block and extending downwardly therefrom in a plane spaced from said crook-shaped arm, said yoke being adapted to rest against the opposite side of the pole, and a long rope tied to said stub arm for tilting said assembly to effect disengagement thereof from said pole,

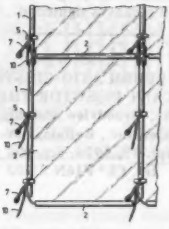
whereby the main section may be released from said pole by pulling on said rope from a ground position.

3,995,715

PROTECTIVE COVERING FOR SCAFFOLDING

Uolevi Eerikki Virtanen, Makitie, Finland, assignor to A. Ahlstrom Osakeyhtio, Kauttua, Finland

Filed Sept. 10, 1975, Ser. No. 612,023
Int. Cl.² E04G 21/38; E04B 1/343
U.S. Cl. 182—129 4 Claims



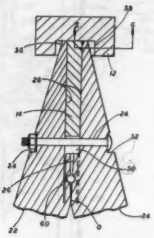
1. In combination with a scaffolding comprised of interconnected vertically and horizontally disposed members forming a skeleton frame, a covering constructed of a plurality of sheets of plastic having bead portions of cylindri al form on each edge of each sheet, vertically and horizontally disposed elongated tubular profiles each having a slot opening from the interior through the wall of the profile, the slots having a width less than the diameter of the interior of the profiles, each profile surrounding the bead portions of two abutting sheet edges thereby securing the sheets to each other, the length of each tubular profile corresponding substantially to the length of the respective sheet edges to which it is fastened, said sheets and their respective tubular profiles being arranged so that at a corner of a sheet two profiles are disposed in end-to-end relationship, and flexible attaching means attaching the ends of said two profiles to facilitate folding of the covering at the location of said flexible attaching means, and a plurality of resilient attachment members partly surrounding the profiles and provided with a string for holding the profiles in related assembly with adjacent members of the scaffolding at spaced intervals along the length of the profiles.

3,995,716

KNOCKDOWN SAW HORSE WITH CLAMP TYPE LEGS

Robert M. Bond, 973 Shadybrook Drive, Akron, Ohio 44312

Filed Aug. 27, 1975, Ser. No. 608,186
Int. Cl.² F16M 11/00
U.S. Cl. 182—186 9 Claims



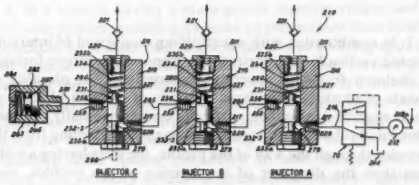
1. A saw horse comprising a top member, a dependent web member, a pair of support leg means and a pair of securing bolt means, one engaging each one of said support leg means, and characterized by each of said support leg means comprising a pair of identical support members, each having a flat surface and a flat clamping surface formed on adjacent but offset inner surfaces thereof, said surfaces being at the upper end portions of said support leg means when operatively positioned and with said abutting surface being spaced from the ends of said support members and said clamping surfaces extending to the ends of such members, said abutting surfaces being at a first acute angle to the longitudinal axis of said support member and said clamping surfaces being at an acute angle differing several degrees from and being smaller than said first acute angle whereby said support leg means can be clamped together and to said web member by said bolt means with at least a portion of said abutting surfaces initially being in contact to draw said clamping surfaces against said web member as said bolt means is tightened.

3,995,717

SEQUENTIAL LUBRICATION DISTRIBUTOR AND LUBRICANT INJECTOR THEREFOR

Kenneth K. Kroffke, Broadview Heights, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,401
Int. Cl.² F16N 25/02
U.S. Cl. 184—7 F 15 Claims



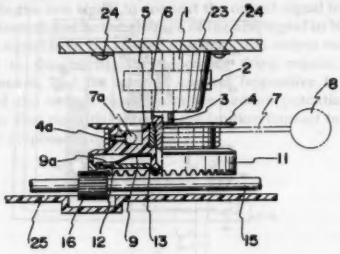
1. A cyclical centralized lubrication system comprising intermittently operable lubricant pump means and lubricant distributor means connected to said pump means, said lubricant distributor means comprising a plurality of lubricant injector units hydraulically interconnected for sequential operation, each of said lubricant injector units comprising a spring-biased piston movable from a retracted position to a lubricant displacement position and back to a retracted position during each lubrication cycle of said system, said lubrication distributor system being constructed and arranged such that lubricant from only one of said units returns to said pump means upon completion of a lubrication cycle.

3,995,718

SPRING DRIVE MEANS FOR TOYS

Yasuo Nakamori, Matsudo, Japan, assignor to Sanyo Onkyo Seiki Co. Ltd., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,972
Claims priority, application Japan, June 6, 1974, 49-65751; June 6, 1974, 49-65752
Int. Cl.² F03G 1/00
U.S. Cl. 185—39 6 Claims



1. A spring drive arrangement for a toy comprising:
   a. a support;
   b. a winding shaft having a first axis and mounted on said support for rotation about said axis;
   c. a spiral spring having respective ends secured to said shaft and to said support;
   d. winding means for turning said shaft and for thereby storing energy in said spring, said spring when wound tending to turn said shaft;
   e. a driven shaft mounted on said support for rotation about a second axis transverse to said first axis and carrying a gear wheel; and
   f. clutch means for releasably connecting said shafts and for thereby transmitting torque from said spring to said driven shaft, said clutch means including:
      1. a plate spring member and a crown gear member mounted for rotation about said first axis and having each a central portion adjacent said first axis and a peripheral portion spaced from said first axis,
      2. said plate spring member being connected to said winding shaft for simultaneous rotation with the connected shaft,
      3. said crown gear member meshingly engaging said gear wheel,
      4. cooperating engagement means on said peripheral portions of said members and axially alignable by relative rotation of said members, the resilient force of said plate spring member biasing the aligned engagement means into torque transmitting engagement, said engagement means responding to torque applied to said members sufficient to overcome said resilient force by being disengaged, and
      5. retainer means for axially securing said central portions relative to each other.

3,995,719

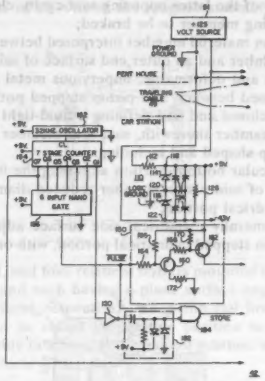
ELEVATOR SYSTEM

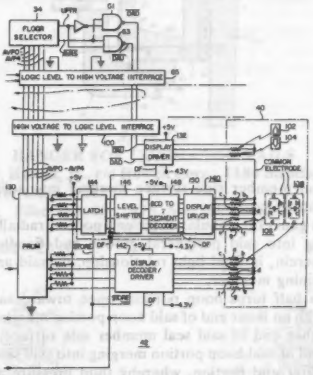
Alan F. Mandel, Pittsburgh, and Leonard C. Vercelliotti, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 16, 1975, Ser. No. 578,304
Int. Cl.² B66B 3/02
U.S. Cl. 187—29 R 17 Claims

1. Position indicator apparatus for an elevator system having an elevator car mounted for movement in a building having a plurality of floors, comprising:
   means providing a binary signal indicative of the position of the elevator car relative to the floors of the building,
   memory means,
   power supply means activating said memory means,
   display means,

said memory means providing output signals for said display means responsive to said binary signal, with said output signals being indicative of the desired display notation for each different binary signal, enabling different display





notations in different buildings responsive to the same binary signal while using identical external connections between said memory means and said means providing the binary signal, and between the memory means and said display means.

3,995,720

TRUCK DAMPING

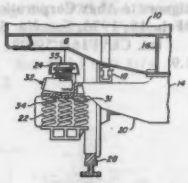
Donald Wiebe, Sewickley, Pa., assignor to A. Stuck Co., Pittsburgh, Pa.

Division of Ser. No. 134,126, April 15, 1971, Pat. No. 3,837,292, which is a continuation-in-part of Ser. No. 857,274, Aug. 22, 1969, Pat. No. 3,595,350, which is a continuation-in-part of Ser. No. 709,142, Feb. 28, 1968, abandoned. This application July 15, 1974, Ser. No. 488,263

Int. Cl.² B61F *5/06, 5/12, 5/24;* **B61H** *11/00*

U.S. Cl. 188—33 **10 Claims**

1. A method of damping relative movement between components of a railway car which is selectively operable in a loaded and unloaded condition and wherein a closed hydraulic damping system having relatively movable portions is located within a spring group normally supporting such components, comprising the steps of: maintaining at least one of said portions out of operative engagement with the adjacent one of said components such that said hydraulic damping system is in standby to damp said relative movement when said railway car is normally operating in said unloaded condition; and damping said relative movement by maintaining operative engagement



of both of said portions with respective adjacent ones of said components when said railway car is normally operating in said loaded condition.

3,995,721

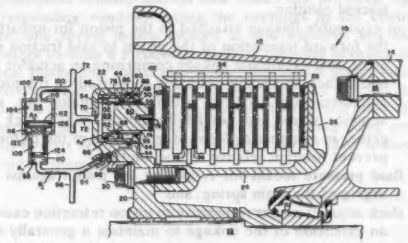
PISTON AND EXTENSIBLE CYLINDER THEREFOR

Warren D. Chambers, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 3, 1976, Ser. No. 663,409

Int. Cl.² F16D *65/52*

U.S. Cl. 188—71.8 **12 Claims**



1. Fluid pressure responsive piston means and extensible cylinder means therefor comprising:

a source of controlled pressurized fluid;

a chamber vented to said controlled pressurized fluid;

a cylinder slidably disposed in said chamber and provided with differential first and second fluid pressure responsive fixed area portions exposed to said controlled pressurized fluid and an amplified pressurized fluid of constant volume, respectively, which generate opposing forces;

a piston slidably carried by said cylinder and responsive to said controlled pressurized fluid;

fluid pressure amplifier means responsive to said controlled pressurized fluid and operatively connected to said amplified pressurized fluid for pressurizing the same to maintain a predetermined pressure ratio relationship between said controlled pressurized fluid and said amplified pressurized fluid and thus a force balance on said cylinder; and

first abutment means provided on said cylinder and adapted to be engaged by said piston upon movement of said piston axially to a predetermined position in said cylinder whereupon continued movement of said piston causes axial displacement of said cylinder and a corresponding extended stroke of said piston.

3,995,722

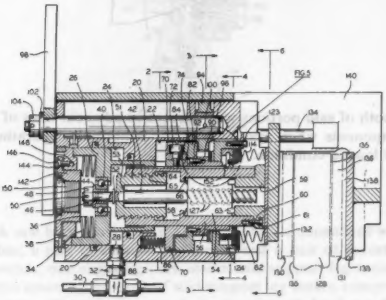
FAIL-SAFE DISC BRAKE HAVING A SLACK ADJUSTER MECHANISM

Roger D. Jones, Ramsey, N.J., and Charles M. Buchholtz, New York, N.Y., assignors to Abex Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,884

Int. Cl.² F16D *59/02*

U.S. Cl. 188—71.9 **18 Claims**



1. A brake actuator for a brake system having a friction element engageable against a rotatable braking surface and comprising:

a housing presenting only a single brake control chamber for fluid under pressure;

a piston reciprocal within the chamber and having a retracted position, said piston being the only piston for exerting brake forces;

a main spring urging the piston forward away from its retracted position;

an expansible linkage attached to the piston for imparting the forward translation of the piston to said friction element, said expansible linkage comprising an actuator nut and an actuator screw rotatably supported on the piston and threadedly received within the actuator nut, said actuator screw and nut having threads which lock together in response to forward movement of the piston to prevent rotation relative to one another;

fluid pressure means for retracting the piston against the urging of the main spring; and

slack adjuster means responsive to piston retraction causing an extension of the linkage to maintain a generally uniform spring expansion per brake application regardless of friction element wear, the last-named means comprising a one-way friction clutch member having a clutch surface effective to tenaciously grip and hold the actuator nut, permitting forward movement while preventing retracting movement of the actuator nut.

3,995,723

DEFORMABLE RIGID SEAL FOR A HYDRAULIC BRAKE APPARATUS

Orla L. Holcomb, Jr., South Bend, Ind., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 13, 1975, Ser. No. 604,276

Int. Cl.² F16D *55/18*

U.S. Cl. 188—72.4 **3 Claims**

1. Hydraulic brake apparatus comprising in combination:

a. a cylinder housing having a cavity formed therein with a closed end and an open end, said cavity being generally U-shaped in a cross-section of said housing;

b. a port in said closed end connected with a source of fluid pressure;

c. an annular retaining member fixedly secured to said housing and having a central bore that forms a portion of said housing cavity, with an inner annular end surface of said retaining member forming a portion of a peripheral groove in said housing;

d. a generally cup-shaped stepped piston member slidably received within said cavity and having a reduced diameter stepped cylindrical portion, with an inner circular end surface of the latter opposing said cavity closed end;

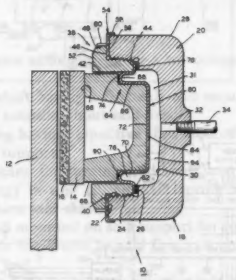
e. a rotating member to be braked;

f. a friction material member interposed between said rotating member and an outer end surface of said piston; and

g. a rigid and deformable, impervious metal seal member interposed between said piston stepped portion and said cavity closed end and defining a fluid-tight variable volume chamber therewith, said seal member being generally cup-shaped and including:

i. a circular bottom portion adjoining the inner end surface of said piston member reduced diameter stepped cylindrical portion;

ii. a generally cylindrical side surface adjacent to said piston stepped cylindrical portion, with one end of said



seal member side surface merging into said circular bottom portion;

iii. a generally annular outer end portion radially extending into said peripheral groove and fixedly secured therein, in fluid-tight relationship, by said annular retaining member;

iv. a half torus hoop portion, open toward said cavity, with an inner end of said hoop portion merging into the other end of said seal member side surface, an outer end of said hoop portion merging into said seal member outer end portion, whereby fluid pressure applied to said variable volume chamber causes plastic deformation of said seal member thereby displacing said piston and consequently said friction material member into engagement with said rotating member, whereas reduction of said fluid pressure in said variable volume chamber causes elastic deformation of said seal member which in turn permits a slight retraction of said friction material member from said rotating member.

3,995,724

CENTERING DEVICE FOR A RAIL BRAKE MAGNET UNIT

Ernst Katzer, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 11, 1975, Ser. No. 567,435

Claims priority, application Germany, Apr. 18, 1974, 2418636

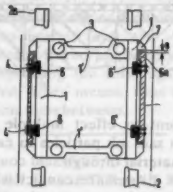
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² F16D *65/34*

U.S. Cl. 188—165 **6 Claims**

1. A device on a vehicle structure for centering a rail brake magnet assembly comprising at least one rail brake magnet having four corners substantially rectangularly arranged on the upper portion thereof and vertically movable between a

lowered operative position and a raised inoperative position, comprising means on each of the four corners for defining a slide surface thereon, each of said slide surfaces being inclined from the vertical downwardly toward a side of the magnet assembly such that transversely opposed slide surfaces on different sides of an axis of the magnet assembly are oppo-



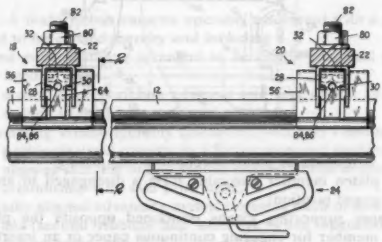
sitely inclined, and four resilient buffers mounted on the vehicle structure and each having a plane surface engageable by said slide surfaces respectively when the rail brake magnet assembly is in its raised inoperative position to retain the magnet assembly in a fixed and centered position with respect to the said vehicle structure.

3,995,725

HANGER FOR CONDUCTOR RAILS

Alleyne C. Howell, Jr., c/o Howell Corp., 1180 Stratford Road, Stratford, Conn. 06497

Filed Oct. 28, 1975, Ser. No. 626,372
Int. Cl.² B60M *1/34*
U.S. Cl. 191—23 A **16 Claims**



1. A hanger construction for supporting a conductor rail in rail-type electrification systems, comprising in combination:

a. a cross support member adapted to extend transversely of the conductor rail,

b. a U-shaped spring clip having opposed legs, carried by the cross support member and adapted to receive the conductor rail between the legs thereof,

c. cooperable holding means on the cross member and spring clip for holding the latter in either extended or retracted positions on the cross member,

d. the legs of the clip being separable an extent when in the extended position to receive between them said conductor rail, and

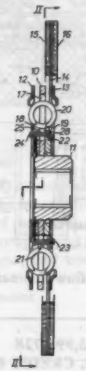
e. cooperable blacking means on the cross support member and spring clip, blocking the legs on the latter to prevent them from spreading and releasing the conductor rail when the clip is in its retracted position on the cross member.

3,995,726

CLUTCH ASSEMBLY

Gérard De Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 11, 1975, Ser. No. 603,683
Claims priority, application France, Aug. 23, 1974, 74.28929; Aug. 1, 1975, 75.24073
Int. Cl.² F16D *3/14*
U.S. Cl. 192—106.2 **20 Claims**



1. A torque-transmitting, torsionally resilient coupling comprising a central plate formed with a plurality of radially-disposed openings, a pair of interconnected lateral plates which are disposed one on each side of the central plate for angular displacement relative thereto and which are provided with corresponding windows facing the openings in the central plate, and spring means located in said windows and said openings to form a torsionally-resilient coupling between the lateral plates and the central plate, the lateral plates being interconnected by feet formed integrally on one or each lateral plate and which are engaged in the other lateral plate, the material from which each of said feet are formed being provided by part of the material removed from the plate to form a window therein.

3,995,727

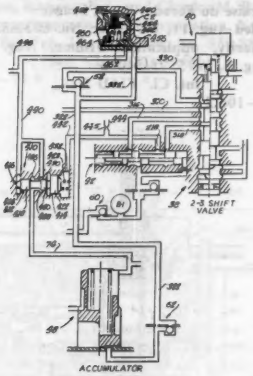
AUTOMATIC LUBRICANT FLOW INCREASE VALVE

John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,905
Int. Cl.² F16D *13/72*
U.S. Cl. 192—113 B **4 Claims**

1. In a control system for an automatic transmission which includes a source of regulated fluid pressure, shift valve means adapted to change ratio in the transmission mechanism by exhausting a first friction device of pressure and engaging a second friction device by supplying pressure thereto, lubricant valve means connected to said shift valve means and to said regulated source of pressure, said second friction device having lubricant distributing means adapted to conduct lubricating oil to the friction plates in said device, said lubricant valve means also being connected to said lubricant distributing means, an exhaust conduit for exhausting fluid pressure from said first friction device, said lubricant valve being connected to said exhaust conduit whereby when pressure is exhausted through said exhaust conduit as initiated by said shift valve means when said second friction device is to be engaged, the initial high value of pressure in said exhaust conduit acting on said lubricant valve means to move same to a position to connect said source of regulated pressure momentarily to said

lubricant distributing means whereby temporarily an increased flow of fluid is provided to said clutch plates to provide increased lubricant flow for said clutch plates during engagement of same.

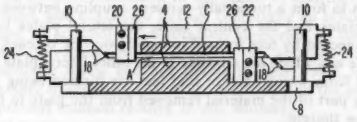


3,995,728

ANTI-VANDAL CREDIT CARD GATE

Robert A. Kerby, Wallington, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 12, 1976, Ser. No. 657,511
Claims priority, application United Kingdom, July 5, 1975, 28822/75
Int. Cl.² G07F 1/06
U.S. Cl. 194—4 D 4 Claims



1. In a device for allowing the insertion of a credit card into a cash dispenser or the like, but preventing the insertion of coins or other foreign objects, the combination comprising two movable portions in superimposed position, each of said portions having two complementary inclined surfaces toward their outer ends, said surfaces allowing relative sliding of both portions so as to form a slot opening therebetween, one block each attached to both movable portions, respectively, said blocks being slightly closer together than the width of an inserted credit card; and spring means urging said movable portions against each other so as to keep them interengaged in their normal position.

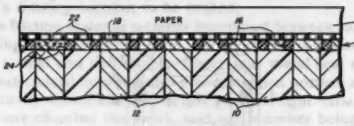
3,995,729

IMPACTLESS PRINTING APPARATUS

Wolfgang Rainer Anton, and Ernst Reinhold Gebhardt, both of Nurnberg, Germany, assignors to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Continuation-in-part of Ser. No. 493,205, July 31, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,295
Claims priority, application Germany, Aug. 7, 1973, 2339852; Dec. 21, 1974, 2461016
Int. Cl.² B41J 31/05, 3/00
U.S. Cl. 197—1 R 8 Claims

4. A non-impact printer comprising,
a writing electrode,
an open mesh counterelectrode,
a ribbon having conductive ink particles suspended in an insulating binder located between said writing electrode and said counterelectrode, and
means for applying a voltage across said writing electrode and said counterelectrode over a predetermined time interval sufficient to effect multiple electrical breakdowns between said ink particles to cause movement of said marking material through said counterelectrode to a record element in pressure contact with the surface of said counterelectrode opposite the surface in contact with said ribbon.

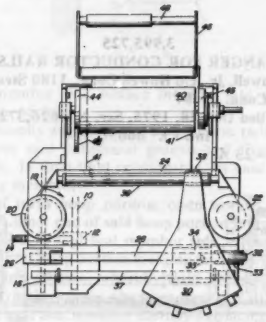


3,995,730

DOT MATRIX IMPACT PRINTER HAVING RETRACTABLE PLATEN

Okun Kwan, Trumbull, and Robert Jefferys, Darien, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 31, 1975, Ser. No. 563,390
Int. Cl.² B41J 13/00
U.S. Cl. 197—127 R 10 Claims



1. A retractable platen mechanism comprising:
a platen member moveable form a disengaged to an engaged position;
paper supporting means positioned opposite the platen member for engaging continuous paper or an insertable non-continuous form between the supporting means and the platen member when the member is in an engaged position;
an opening in the supporting means for admitting printing means therethrough for printing on continuous paper or an insertable non-continuous form when the platen member is in he engaged position;
cam following means mounted to the platen member for movement therewith;
first electromagnetic means having a member moveable between first and second positions;
linkage means connected between the moveable member and camming means which drives the cam following means, energization of the electromagnetic means causing the camming means to force displacement of the cam following means by an amount accomplishing movement of the platen member to an engaged position;
paper supply and take-up means for moounting continuous paper thereon;

means located between the supply and take-up means for guiding continuous paper between the supporting means and the platen member;

first roller means located near the platen member for supporting a moveable length of continuous paper thereon;

means located adjacent the platen member for detecting the insertion of a non-continuous form adjacent a platen member;

second electromagnetic means actuable in response to the detection of an inserted form; and

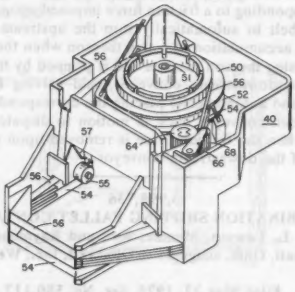
second roller means linked to the second electromagnetic means for depressing the form against the continuous paper and first roller means. thus accomplishing joint indexed motion therebetween.

3,995,731

MULTI-RIBBON CASSETTE AND RIBBON DRIVE

Harry R. Miller, Trumansburg, and Michael S. Kumpf, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed June 2, 1975, Ser. No. 580,265
Int. Cl.² B41J *33/10, 33/04*
U.S. Cl. 197—168 10 Claims



1. A multi-ribbon cassette operably associated with a print head to be carried thereby and including a

first endless ribbon arranged to be driven past said print head,

a second endless ribbon adjacent said first ribbon and arranged to be driven past said print head,

camming means operably connected with said cassette for positioning said cassette in a first or a second position for aligning said first or said second endless ribbon in printing relationship with said print head,

axially aligned advancing means engaging each of said first and second ribbons and effective when operated for driving same, and

means aligned with each of said advancing means and effective for driving one or the other thereof dependent upon the position of said cassette.

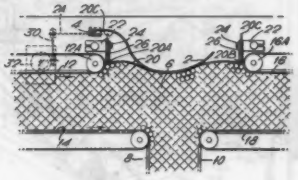
3,995,732

CONVEYOR SYSTEMS FOR CIGARETTES OR OTHER SIMILAR ROD-LIKE ARTICLES

Victor Charles Figes, Richmond, Va., and Stanley Ivor Bowen, London, England, assignors to Molins Limited, England

Filed Apr. 24, 1973, Ser. No. 354,076
Claims priority, application United Kingdom, Apr. 25, 1972, 19177/72
Int. Cl.² B65G *43/08*
U.S. Cl. 198—524 16 Claims

1. A cigarette conveyor system comprising means defining a junction zone; first and second conveyor means for feeding cigarettes respectively into and out of the junction zone; a sensor mechanism comprising a sensor member above the junction zone and a flexible elongated membrane which extends transversely to the axes of the cigarettes and confines the upper surface of the cigarettes in the junction zone and on which the sensor member rests; anchorage means for securing the ends of the membrane at two fixed anchorage points against downward and upward movement, the length of the membrane extending between the anchorage points being



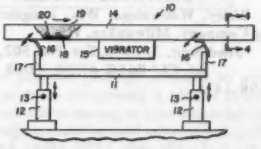
greater than the distance between the anchorage points; a ceiling plate, above the membrane, extending substantially horizontally from one of the anchorage points in the direction towards the other anchorage point to limit upward movement of part of the membrane; and control means responsive to movement of the sensor member to control the operation of one of said conveyor means.

3,995,733

VIBRATORY PILE CONVEYOR SYSTEM

Dennis E. Mead, Cazenovia, N.Y., assignor to Lipe-Rollway Corporation, Liverpool, N.Y.

Continuation-in-part of Ser. No. 137,442, April 26, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 313,123
The portion of the term of this patent subsequent to Feb. 5, 1991, has been disclaimed.
Int. Cl.² B65G *27/00*
U.S. Cl. 198—766 1 Claim



1. In a conveyor system having a base and a generally horizontal element supported on said base by resilient strips and vibrated in a motion that includes a rise and fall of said element to feed objects along the length of said element, the improvement comprising:

a. the feed surface of said element being covered with a pile material having flexible filaments uniformly inclined by about 5°–25° from the vertical toward said feed direction along the length of said element;

b. said filaments having uniform length and thickness and a sufficient density so that only the tips of said filaments support said objects to be fed;

c. means for vibrating said element in a generally reciprocal motion at a vibration angle aligned generally with the pile angle; and

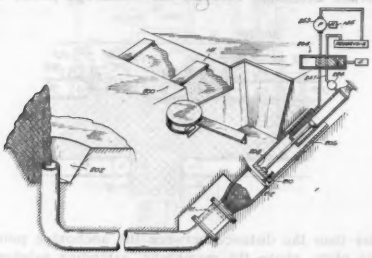
d. said filaments being sufficiently resilient to flex under said objects during upward movement of said element in said vibratory motion to increase the feeding speed and force of said element in moving said objects in said feed direction.

3,995,734

MANURE TRANSFER APPARATUS

Vernon R. Berg, Jr., 413 W. Park St., Marshfield, Wis. 54449

Filed Feb. 13, 1975, Ser. No. 549,633
Int. Cl.² B65G 25/08
U.S. Cl. 198—540 7 Claims



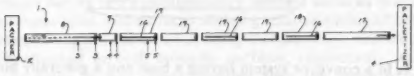
1. Apparatus for pumping animal waste from a livestock facility to a remote storage area comprising wall means defining a pumping chamber having an inlet and an outlet connected to a discharge pipe, an aperture in said pumping chamber wall means, wall means defining a hopper surrounding said inlet, a ram having wall means defining a ram head, valve means in said pumping chamber aperture affording communication of said pumping chamber with the atmosphere means for reciprocating said ram between an advanced position with said ram head in said pumping chamber and a retracted position with said ram free of said pumping chamber to allow waste to move into said pumping chamber beneath said ram and said valve means affording entry of air through said aperture into said pumping chamber between said ram and said discharge pipe to reduce vacuum during withdrawal of said ram to the retracted position to facilitate return of said ram to the retracted position, and said valve means closing said aperture during movement of said ram to said advanced position to prevent escape of pressure from said pumping chamber.

3,995,735

CONVEYOR SYSTEM

Robert F. Risley, Wauwatosa, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Sept. 3, 1974, Ser. No. 502,760
Int. Cl.² B65G 47/26, 43/08
U.S. Cl. 198—425 11 Claims



1. In a conveyor system for transporting articles in trains or slugs between spaced upstream and downstream stations, said system comprising an infeed portion at the upstream station and a discharge portion at the downstream station and an intervening portion between the infeed and discharge portions, drive means for the intervening portion of the conveyor system, a first brake belt conveyor at the downstream end of the infeed portion, means to drive and stop the first brake belt conveyor to provide for the accumulation of a slug on the infeed portion and the subsequent delivery of the newly formed slug from the infeed portion to the intervening portion of the conveyor system, first means upstream from the first brake belt conveyor to signal the accumulation of a full slug on the infeed portion, and second means downstream from the first brake belt conveyor to signal the capability of the intervening portion for receiving a newly formed slug, said first and second signal means together serving to control the operation of the first brake belt conveyor, said discharge portion of the conveyor system comprising a terminal conveyor and a second brake belt conveyor upstream from the terminal conveyor, said second brake belt conveyor having a length somewhat exceeding the length of a slug of the articles, means to drive and stop the second brake belt conveyor, third means to signal the capability of the terminal conveyor to receive the next following slug, and fourth means to signal the arrival of said next following slug on the second brake belt conveyor, said third and fourth signal means together serving to control the operation of the second brake belt conveyor and effecting a stoppage thereof for accumulation thereon of said next following slug when the terminal conveyor is not able to receive said next following slug.

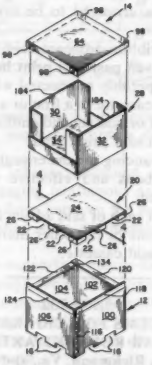
10. In a conveyor system for transporting articles in trains or slugs, at least a pair of belt conveyors arranged in upstream and downstream serial relation with at least the upstream belt conveyor having a length somewhat exceeding the length of a slug of the articles, means to drive and stop the belt of the downstream conveyor, an hydraulic motor to drive the belt of the upstream conveyor, a source of fluid pressure, means to conduct fluid pressure from said source to said motor, pressure compensated flow control valving in said conducting means between said source and the motor and providing for a torque to drive the corresponding belt generally proportional to the momentary demand on said corresponding belt, said valving responding to a friction force imposed upon the corresponding belt to automatically stop the upstream conveyor and effect accumulation of a slug thereon when the lead article of the slug thereon reaches and is stopped by the stopped belt of the downstream conveyor, said valving further responding and automatically placing the corresponding belt of the upstream conveyor back in motion to dispatch the slug thereon when the friction force is removed upon start up of the belt of the downstream conveyor.

3,995,736

COMBINATION SHIPPING PALLET/CONTAINER

DeWayne L. Lawson, Mentor, Ky., and Raymond D. Roof, Cincinnati, Ohio, assignors to Olinkraft, Inc., West Monroe, La.

Filed May 22, 1975, Ser. No. 580,117
Int. Cl.² B65D 19/00, 19/38
U.S. Cl. 206—386 10 Claims



1. An improved shipping container with built-in pallet for use in conjunction with pairs of fork prongs of both a forklift truck and a jack truck, the container comprising:

a. an outer container structure having a plurality of serially joined side panels, an open bottom, and pairs of side openings formed in the bottom portions of each of the side panels for receiving a pair of truck fork prongs, said side openings each having an upper horizontal edge and two opposite vertical side edges;

b. an inner pallet structure positioned within the bottom portion of the outer container structure and having a top sheet and a plurality of legs attached to the bottom of the top sheet, said legs arranged to form open channels on the bottom of the pallet structure aligned with the side openings of the outer container for receiving the pair of fork prongs;

c. said outer container having tabs hinged on the upper edges of the side openings and bent underneath the top sheet of the pallet structure;

d. an inner container structure positioned within the outer container structure and on top of the pallet structure; and

e. means securing the tabs to the bottom of the top sheet and securing the inner container structure to the outer container structure.

3,995,737
HOLDERS FOR TAPE CASSETTES

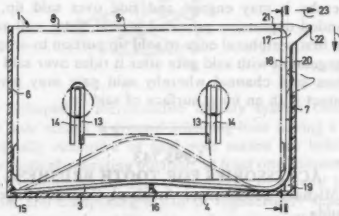
Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

Filed May 30, 1975, Ser. No. 582,117

Claims priority, application Germany, June 5, 1974, 2427107

Int. Cl.² B65D *85/67, 83/00*

U.S. Cl. 206—387 **8 Claims**



1. A holder for a tape cassette or the like, comprising a six-sided housing which encloses the cassette on five of its six sides and has an entrance on its sixth side, the housing having an inner side surface opposite the entrance and having inner housing corners adjacent the inner side surface, and an ejector device which is actuable in order to eject the cassette in the direction of the entrance, and in which the ejector device is a flexible but stiff strip which extends along said inner side surface and between the inner housing corners adjacent thereto, the strip having an end portion extending from one of the corners toward the entrance, the strip being actuable by pushing the end portion of the strip inwardly and then along the inner side surface from one corner so as to arch the strip toward the entrance and away from the inner side surface.

3,995,738
SHIPPING BIN FOR SHEETS WITH DEVICE FOR RESTRAINING MOVEMENT OF THE SHEETS

James R. Rowley, Freeport, and Walter E. Pater, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,912

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

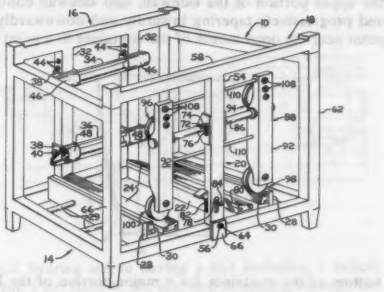
Int. Cl.² B65D *85/48*

U.S. Cl. 206—451 **17 Claims**

1. In combination with a bin for shipping a plurality of sheets wherein the bin is of the type having a base and a substantially vertical backwall for supporting the sheets in a generally vertical position on an edge, a front restraint device comprising:

at least one rigid member having a first end and a second end opposite to the first end; and

means held in position in a plane substantially parallel with the backwall and pivotally mounting said at least one rigid member between the first and second end thereof in



spaced relation to the backwall to pivot said at least one rigid member about an axis generally parallel to the backwall and to the base of the bin.

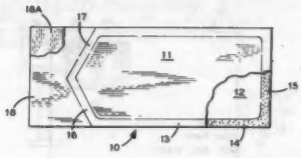
3,995,739
PEELABLE, AUTOCLAVABLE PACKAGING

Robert J. Tasch, Lisle, Ill., and Nitidhan P. Patolia, Stamford, Conn., assignors to Acme Backing Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 302,926, Nov. 1, 1972, abandoned. This application Dec. 27, 1974, Ser. No. 536,801

Int. Cl.² B65D *65/42, 75/30*

U.S. Cl. 206—484 **6 Claims**



1. A heat sealed peelable package sterilized by autoclaving at elevated temperatures comprising a pair of substrates, at least one of said substrates having at least a continuous generally peripheral coating securing said substrates together, said coating comprising about 18.75 parts polyvinyl acetate and about 5.86 parts nitrocellulose, all by weight, said coating retaining its normal peelable adhesive characteristics despite exposure thereof to said autoclaving temperature.

3,995,740
NESTABLE FABRICATED THERMOPLASTIC CONTAINER

Stephen W. Amberg, St. James, and Thomas E. Doherty, Setauket, both of N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

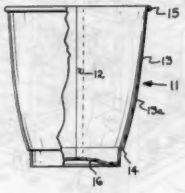
Division of Ser. No. 211,259, Dec. 31, 1971, Pat. No. 3,854,583. This application May 28, 1974, Ser. No. 473,998 The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.³ B65D *3/06, 21/02*

U.S. Cl. 206—520 **17 Claims**

1. A nestable cup-like container comprising, in combination: a sidewall formed by heat shrinking a sleeve formed from a single double-ended sheet of a heat-shrinkable thermoplastic material, and having an inner surface adapted to contact a

liquid product to be contained in said container, the ends of said sheet being joined to one another to form a liquid-tight seam extending from the top to the bottom of said container, said container having a mouth at its top which is defined by the upper portion of the sidewall, said sidewall continuously and progressively tapering inwardly and downwardly from a point near the open mouth of the container to a point near the



bottom of the container for a major portion of the height of the container, the height of said major portion constituting substantially more than one-half of said container, the thickness of the sidewall increasing continuously and progressively over said major portion from a lesser thickness at the top to a greater thickness at the bottom thereof as a result of the heat shrinking of the sleeve; and means joined to the sidewall for closing the bottom of the container in a liquid-tight manner.

3,995,741

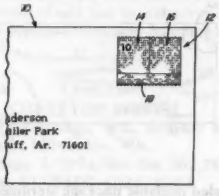
METHOD OF SORTING MAIL USING A CODED POSTAGE STAMP

Joseph P. W. Henderson, Rte. No. 3, Greenfield Trailer Park, Pine Bluff, Ark. 71601

Filed June 17, 1975, Ser. No. 587,688

Int. Cl.² B07C *5/34*

U.S. Cl. 209—111.5 **10 Claims**



1. A method of handling mail on which a postage stamp is affixed, including the steps of: selecting a postage stamp having a destination code established by activating radiation and applying it to the mail; cancelling the postage stamp by exposure of the mail to the activating radiation producing said destination code; sensing the radiation activated destination code on the cancelled postage stamp; and routing the mail in accordance with the radiation activated destination code sensed on the cancelled postage stamp affixed thereto.

3,995,742

FISHING ROD SUPPORT

Milton Austin, 3 Spielman Road, Fairfield, N.J. 07006, and Arthur G. Kendall, 37 Passaic Ave., Livingston, N.J. 07039

Continuation-in-part of Ser. No. 558,961, March 17, 1975. This application Jan. 19, 1976, Ser. No. 650,442

Int. Cl.² A47F *7/00*

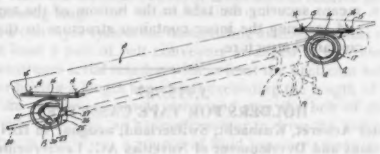
U.S. Cl. 211—60 R **8 Claims**

1. A fishing rod support comprising a pair of cooperating bracket members adapted for attachment to either a horizontal or a vertical surface to support said fishing rod, said bracket members comprising:

a proximal bracket member adapted to receive the handle portion of said rod;

a distal bracket member possessing a U-shaped channel, said channel comprising parallel proximal and distal walls defining the longitudinal dimension thereof and adapted to receive the tip portion of said rod, said longitudinal dimension lying in a plane parallel to the plane of said surface, and said channel possessing a mouth defined by a first and a second peripheral edge of said distal bracket member; and

means associated with said channel for retaining said tip portion securely therein comprising a lip extending into said mouth from said first peripheral edge in a plane



perpendicular to said longitudinal dimension to partially obstruct said mouth, a flexible, resilient gate located in a plane parallel with the plane of said lip, said gate integral at one end thereof with said second peripheral edge, and adapted for pivotable reciprocation within the plane containing said longitudinal dimension, and flexure whereby it may engage and ride over said lip, and a rounded depression provided in said distal wall adjacent said first peripheral edge to said tip portion to drop out of engagement with said gate after it rides over said lip and enters said channel whereby said gate may pivot into contact with an inner surface of said lip.

3,995,743

ACCESSORIES FOR TOOTH BRUSHES

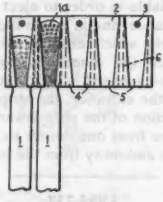
Robin Michael Blackburne, Ardsheal Cottage, Paget 6-20, Bermuda

Filed Feb. 25, 1975, Ser. No. 552,965

Claims priority, application United Kingdom, Mar. 5, 1974, 9916/74

Int. Cl.² A47B *81/02*; A46B *17/04*

U.S. Cl. 211—65 **7 Claims**



1. A combined hanger and bristle press device for a tooth brush which is releasably attachable to the head of a brush when the brush is not in use, and when attached, is cooperable with the bristles of the brush head to deflect the bristles towards each other, the device including a substantially rigid channel member defining a longitudinally extending channel dimensioned to receive at least the bristles of the brush head, the channel being longer than the bristle-containing zone of the head, being open at its opposite ends to permit insertion of at least the bristles of the head through one of said opposite ends into the channel in the longitudinal direction of the channel, and being generally U shaped in cross section, with the base limb and side limbs of the U being defined by generally longitudinally extending inner surfaces of a base member and a pair of opposed side members of the channel member, respectively, at least portions of the opposed inner surfaces of the side members being operable, when the device is attached

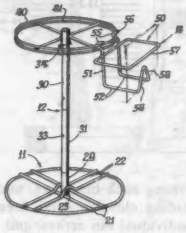
to the head, to deflect the bristles towards each other and to releasably retain the device attached to the head, with the frictional grip between the said portions of the opposed inner surfaces and the bristles being sufficient to enable the brush to be suspended from the device without unintentional release therefrom, the opposed inner surfaces mutually converging from, and in a direction away from, said one opposite end of the channel, over a substantial portion of the length of the channel.

3,995,744

MERCHANDISE DISPLAY RACK

Derek N. G. Metcalf, La Grange Park, Ill., assignor to Athena Industries, Inc., La Grange, Ill.

Filed Feb. 28, 1975, Ser. No. 554,311
Int. Cl.² A47F 5/14
U.S. Cl. 211—131 **4 Claims**



1. A collapsible merchandise display system comprising support pole means, a ground engaging base having a central hub coaxially receptive of said pole means for holding the latter in vertical operating position, at least one support means detachably mounted on said pole means to extend laterally therefrom and comprising a pair of registeringly superposed and parallel spaced rod-like side rails horizontally supported outwardly of said pole means, and a plurality of wire formed basket means, each having an open top article receptive pocket, detachably suspended from said support means and comprising a pair of laterally spaced linear leg portions defining one side of said pocket and having the terminal ends thereof formed as rigid semi-circular hook means, the open sides of which are oriented toward said pocket; said hook means operationally extending between said rails and partially about the uppermost thereof in overlying relation with the lowermost thereof when said basket means is in upright article receiving position on said support means, and said hook means further cooperating with said uppermost rail to prevent detachment of said basket means from said support means except when said basket means is inverted.

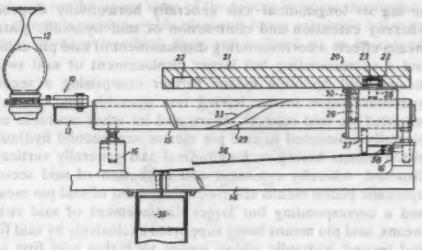
3,995,745

ARTICLE TRANSFER UNIT

Arnold Chambers, Chesterfield, England, assignor to Glass Tubes and Components Limited, Chesterfield, England

Filed Mar. 7, 1975, Ser. No. 556,208
Int. Cl.² B65G 47/00
U.S. Cl. 214—1 BB **5 Claims**

1. A unit for transferring an article from one work station to another comprising an article holder, an arm on which the article holder is mounted, a carriage supporting said arm for reciprocating movement relative to the carriage, means for moving the carriage to carry the arm along a path between said work stations, and camming means for effecting reciprocatory movement of said arm during its travel along said path, the camming means comprising a cam track and a cam follower coupled to the arm and cooperating with the cam track upon movement of the carriage, said unit further having rotary drive means coupling said cam follower to said arm whereby said arm is rotated as it is reciprocated, the said rotary drive means comprising a bearing sleeve fixed to the carriage, said arm being slidably and rotatably received in the bearing



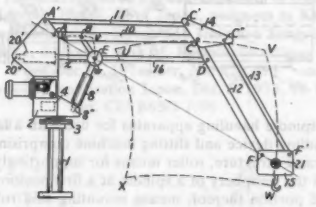
sleeve, said bearing sleeve having a slot including a helical portion, and a pin fixed to the arm and extending through the slot, the pin being coupled to the cam follower for movement of the pin along the sleeve.

3,995,746

HYDRAULIC CRANE MECHANISM OPERABLE TO PROVIDE ENLARGED PARALLEL MOVEMENT

Sadahiko Usagida, Kobe, Japan, assignor to Ohji Seiki Kogyo Kabushiki Kaisha, Kobe, Japan

Filed June 10, 1974, Ser. No. 477,866
Claims priority, application Japan, July 27, 1973, 48-84767
Int. Cl.² B25J 3/00; B66C 23/00
U.S. Cl. 214—1 BD **1 Claim**



1. A hydraulic crane mechanism comprising a vertically disposed post, support means, rotatably mounted on said post, inner and outer parallel boom arms of equal length pivotally connected at spaced locations on said support means, a connecting member pivotally connected to said boom arms such that the latter are maintained in spaced parallel disposition, inner and outer parallel and equal length swing arms pivotally connected to said connecting member, said pivotal connection of said inner boom arm to said connecting member having a common pivot axis with the pivotal connection of said inner swing arm to said connecting member, a swing means pivotally connected to said swing arms such that the latter are maintained in spaced parallel disposition, a first and second associated arm, pin means pivotally connecting said first and second associated arms, said first associated arm being pivotally connected to an intermediate section of said inner boom arm and being disposed parallel to said swing arms, said second associated arm being pivotally connected to an intermediate section of said inner swing arm and being disposed parallel to said boom arms, said inner boom arm being closer to said pin means than said outer boom arm, said inner swing arm being closer to said pin means than said outer swing arm such that portions of said inner boom arm and said inner swing arm along with said two associated arms form a pantograph with said outer boom arm and said outer swing arm being disposed outside of said pantograph, operable means for displacing said

pin means, said operable means comprising a first hydraulic piston means having one operable end pivotally mounted on said support means and its other operable end pivotally connected to said pin means, said first hydraulic piston means having its longitudinal axis generally horizontally disposed whereby extension and contraction of said hydraulic piston means effects a corresponding displacement of said pin means and a corresponding but larger displacement of said swing means, said operable means further comprising a second hydraulic piston means having one operable end pivotally mounted on said support means and its other operable end pivotally connected to said pin means, said second hydraulic piston means having its longitudinal axis generally vertically disposed, whereby extension and retraction of said second hydraulic piston means effects displacement of said pin means and a corresponding but larger displacement of said swing means, said pin means being supported exclusively by said first and second hydraulic piston means such that said first and second hydraulic piston means are operable to freely displace said pin means, whereby displacement of the latter effects a greater displacement of said swing means.

3,995,747

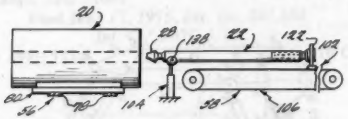
APPARATUS FOR HANDLING LARGE FABRIC ROLLS FOR SLITTING

Ernest L. Lewey, Greensboro; Ned K. Sharpe, Burlington, and James F. Sloan, Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 497,032, Aug. 13, 1974, Pat. No. 3,938,671. This application May 12, 1975, Ser. No. 576,576

Int. Cl.² B65G *61/00*

U.S. Cl. 214—1 P **4 Claims**



1. A spindle handling apparatus for use with a large fabric roll handling device and slitting machine comprising an elongated frame structure, roller means for supportingly engaging beneath the periphery of a spindle at a first position adjacent one end portion thereof, means mounting said roller means adjacent one end of said frame structure for vertical movement between an upper progressive support changing position and a lower support removing position, first power operated means for effecting vertical movement of said roller means between said positions, a carriage structure mounted on said frame structure for horizontal longitudinal reciprocating movement between limiting positions, second power operated means for effecting longitudinal reciprocation of said carriage structure between said limiting positions, said carriage structure having means thereon for engaging a remote end portion of the spindle at a second position in weight supporting and longitudinal force applying relation thereto, and means operable during the movement of said carriage structure between said limiting positions by said second power operated means to effect operation of said first power operated means, whereby the roller means is moved to said lower support removing position after the first mentioned spindle end has been inserted in the roll.

3,995,748

SORTER APPARATUS

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 21, 1975, Ser. No. 597,939

Int. Cl.² B65H *31/24*

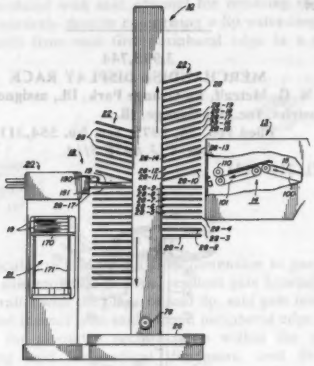
U.S. Cl. 214—6 D **7 Claims**

6. Apparatus for sorting sheets comprising:

a. at least two individual bin arrays, each of said arrays including

1. a stack of individual sheet receiving trays;

2. elevator support means for said tray stacks to permit the tray stacks comprising each of said bin arrays to be individually raised and lowered for receipt and withdrawal of sheets into and out of individual ones of the



trays comprising each bin array, said elevator support means including elevator drive means for selectively operating individual bin arrays; and

b. turntable means supporting said bin arrays, said turntable means including drive means effective when actuated to rotate said bin arrays thereon whereby to move said bin arrays from one operating position to another.

3,995,749

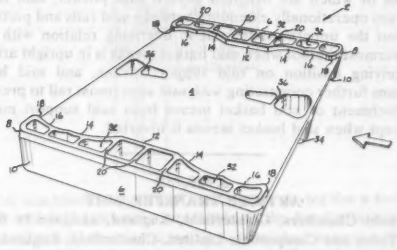
BEER KEG PALLET

Lewis Byron Haskins, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 24, 1975, Ser. No. 551,932

Int. Cl.² B65D *57/00*

U.S. Cl. 214—10.5 R **12 Claims**



1. A pallet adapted to hold and restrain two different sizes of generally cylindrical objects such as beer kegs, which comprises

a. a flat deck having two end portions at the opposite edges thereof;

b. each end portion having an upper and lower portion, said lower portion extending downwardly from said deck and said upper portion extending upwardly from said deck;

c. the inner surface of each of said upper portions having two pairs of curved segments, each pair having a curvature conforming to respectively the curvature of one of the sizes of said cylindrical objects;

whereby when said objects are placed on said deck they are

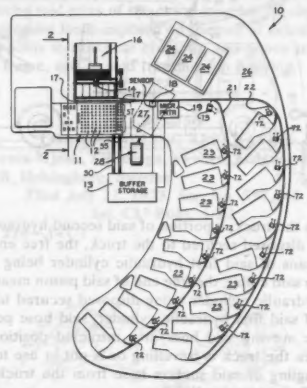
restrained by their abutment with each other and cooperation with said curved segments.

3,995,750

DOCUMENT TRANSPORT AND SYSTEM

Alvin R. Carlson, Pico Rivera, Calif., assignor to Bank of America National Trust & Savings Association, San Francisco, Calif.

Filed Dec. 11, 1974, Ser. No. 531,529
Int. Cl.² B65G *43/00*
U.S. Cl. 214—11 R 10 Claims



1. A document transport system comprising a keyboard of a type for normal use with two hands simultaneously for recording data read from documents by a keyboard operator, a feed hopper disposed to feed documents one at a time from said hopper, means defining a document transport path adapted to carry said documents therealong, a cyclic document transport carrier interposed between said hopper and said path, the surface of said carrier being disposed to receive documents thereon from said hopper at a position exposing the documents for reading by the operator of the keyboard as said carrier moves to carry the documents to said document transport path, means for retaining said documents to move with said carrier during reading by the operator and for releasing said documents from said carrier at a position in the movement thereof so as to discharge said documents into said transport path, and means for moving the documents along said path.

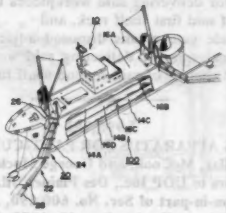
3,995,751

CARGO CONVEYING APPARATUS FOR VESSEL

Sadao Omote, c/o Nissei Shipping Co., Ltd., of Sbacks Bldg., No. 18-14, 1-chome, Hamamatsu-cho, Minato, Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,889
Claims priority, application Japan, June 17, 1974, 49-68967
Int. Cl.² B63B *27/00*
U.S. Cl. 214—15 D 4 Claims

1. A cargo loading apparatus for a cargo vessel having multi-story holds, comprising a loading means disposed adjacent one of the longitudinal ends of said vessel and including a carrying-in conveyor disposed in an inclined position between a quay and the uppermost hold for carrying cargo units from said quay into said uppermost hold, a turning conveyor connected to the upper end of said carrying-in conveyor for turning said cargo units to direct them parallel to the deck of said uppermost hold, and a lowering conveyor linearly extending through all the holds below the uppermost hold of said vessel and through holes in the respective decks between said holds in an inclined position for carrying the cargo units into said lower holds, said lowering conveyor having a plurality of stationary inclined conveyor elements having spaces between them at the positions of the decks of the holds, and movable conveyor elements in the spaces between said stationary conveyor elements and pivotally connected to the stationary elements on the upper sides of the spaces between the stationary elements, said movable elements being pivotable between a first position in which they are inclined so as to extend



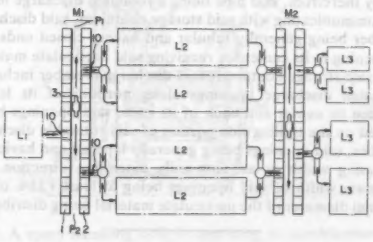
through the openings in the respective decks and between spaced stationary conveyor elements, whereby cargo units are transferred to the lower one of the adjacent holds above and below the respective decks, and a second position in which said movable elements are horizontally positioned so as to rest on closed hatch covers for the openings in the respective decks, whereby the cargo units are transferred to the holds above the respective decks.

3,995,752

PRODUCTION LINES WITH LIFT VEHICLES, STACKER CRANES AND STORAGE MEANS BETWEEN THE LINES

Junnoshin Tamura; Hachirou Furubayashi, both of Osaka, and Touji Higashio, Hakui, all of Japan, assignors to Kawasaki Heavy Industries, Ltd., Hyogo and Ichimura Sangyo Kabushiki Kaisha, Ishikawa, both of, Japan

Filed Dec. 2, 1974, Ser. No. 528,613
Claims priority, application Japan, Dec. 5, 1973, 48-135264
Int. Cl.² B65G *1/06*
U.S. Cl. 214—16.4 A 1 Claim



1. A production facility comprising a plurality of intermediate storage installation production lines comprising

a mobile vehicle with a lift means, interconnecting twin-track transfer rails disposed parallel to, and terminating at right angles with respect to, said intermediate storage installation, a turntable means positioned at said right angular termination point to facilitate directional change of said vehicle, whereby to permit said vehicle to transfer workpieces from said production lines to said intermediate storage installation by transversal of said interconnection transfer rails via said turntable means,

said production lines being disposed so as to create a space therebetween comprising said intermediate storage installation,

said installation comprising a pair of spaced shelf racks arranged parallel to one another in a direction perpendic-

ular to the flow of workpieces between said production lines and said shelf racks defining a passageway therebetween and having first and second outer, longitudinal sides,

a plurality of shelves in each of said shelf racks,

a stacking crane in said passageway to move said workpieces to and from said pair of shelf racks,

a first side gate means disposed adjacent said first longitudinal side for delivering said workpieces to and from said shelves of said first shelf rack, and

a second side gate means disposed adjacent said second longitudinal side for delivering said workpieces to and from said shelves of said second shelf rack.

3,995,753

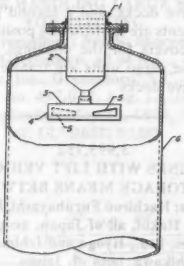
DISPENSING APPARATUS FOR PARTICULATE MATTER

Robert F. Millar, McCook, and George Mack, Justice, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 600,690, July 31, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,501

Int. Cl.² B65G *65/32*; G01F *11/20*

U.S. Cl. 214—17 CB **17 Claims**



1. A dispensing apparatus for particulate material, the particles thereof having a nominal diameter comprising a storage container and a rotatable discharge pipe extending downwardly therefrom, said pipe being a rotatable discharge member communicating with said storage container, said discharge member being generally tubular and having closed ends and an opening in its center for receiving said particulate material from said storage container, said discharge member including elongated discharge openings along portions of its length between its center and each of its ends, said openings being located on the trailing side portion of said rotatable discharge member, said openings being generally tapered and having an increasing width in an outwardly extending direction, the minimum width of said openings being at least 125% of the nominal diameter of the particulate material being distributed.

3,995,754

GARBAGE VACUUM COMPACTOR DEVICE

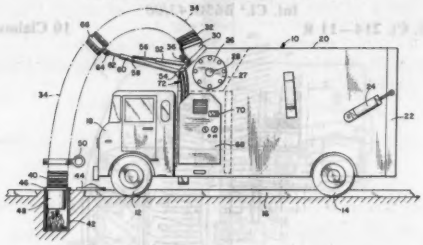
Helen DeKoning, W. Babylon, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Continuation of Ser. No. 446,311, Feb. 27, 1974, abandoned. This application May 1, 1975, Ser. No. 573,734

Int. Cl.² B60P *1/60*

U.S. Cl. 214—83.26 **1 Claim**

1. In a garbage handling device for use with a garbage truck having a garbage receiving chamber and an elongated suction hose for receiving at one end garbage to be handled, and for discharging at the hose outlet end such garbage into the garbage receiving chamber of the truck, including suction producing means for producing suction in said suction hose for drawing garbage into and through said hose, hose positioning means for moving and positioning said hose for garbage intake, said suction producing means comprising a rotary fan coupled to said garbage suction hose for producing suction therein so as to suction garbage into the intake end of said hose from a source of garbage and for conveying said garbage along the length of said hose and into said truck chamber, the improvement wherein said hose positioning means comprises a first hydraulic cylinder and piston means, a collar, the collar being fixedly secured to the outside surface of the hose at a point intermediate the intake end and the other end of the hose, a portion of said first hydraulic cylinder being disposed



secured to the truck, a portion of said second hydraulic cylinder being disposed secured to the truck, the free end of said piston means of said first hydraulic cylinder being disposed secured to said collar, the free end of said piston means of said second hydraulic cylinder being disposed secured to another portion of said first hydraulic cylinder, said hose positioning means for moving said hose in a retracted position on the truck when the truck is travelling or is not in use to thereby avoid dangling of said suction hose from the truck and the causing of accidental collisions.

3,995,755

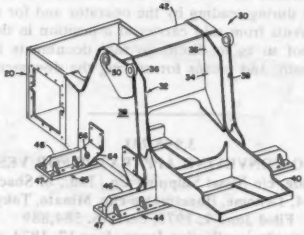
FRAME FOR SUPPORTING AN INDUSTRIAL LOADER BOOM ASSEMBLY

Joseph Francis Wagner, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 6, 1975, Ser. No. 547,589

Int. Cl.² E02F *3/80*

U.S. Cl. 214—140 **7 Claims**



1. In an industrial loader of the track-laying type including a pair of transversely spaced track support frames extending longitudinally at opposite sides of the loader just outboard of a pair of transversely spaced longitudinally extending sides of an upstanding framework secured to the track support frames by longitudinally spaced front and rear crossbars having respective central portions secured to the framework and respective opposite ends secured to the track support frames, a transversely extending transmission housing fixed to the rear of the framework, a loader boom assembly including a pair of loader booms having respective rear ends vertically pivotally connected to upper locations of the opposite sides of the framework, and a pair of extensible and retractable hydraulic actuators having respective first ends respectively coupled to

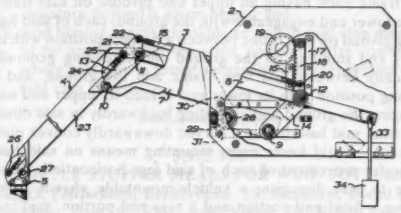
the pair of booms and having respective rear ends respectively coupled to the sides of the framework by a pair of pins respectively received in a pair of pin receptacles respectively located in the pair of sides of the framework, the improvement comprising: said pair of pin receptacles being located adjacent to and forwardly of a forward surface of said rear crossbar; a pair of structural member means respectively connected to the pair of sides of the framework and respectively including a pair of first section means respectively extending between and engaging said pair of pin receptacles and said forward surface of the rear crossbar and a pair of second section means respectively extending between and engaging a rear surface of said rear crossbar and a forward surface of said transmission housing whereby said pairs of structural member means will transfer compressive loads imposed on the pair of actuators by said pair of booms to said rear crossbar, and hence to said track support frame, and to said transmission housing.

3,995,756

LOAD HANDLING APPARATUS

Odd Werner Hjelm, Eldsberga, Sweden, assignor to Foralkranar AB, Helsingborg, Sweden

Filed July 21, 1975, Ser. No. 597,745
Int. Cl.² B66C *1/22*
U.S. Cl. 214—147 T **11 Claims**



1. In a load handling apparatus comprising a frame, an apparatus head mounted on said frame and rotatable in a horizontal plane, and an arm mounted on the apparatus head, said arm having an inner portion in the form of a parallelogram linkage with two parallel longitudinal links which are swingable in a vertical plane relative to said apparatus head and are connected by joints at their ends, to an outer transverse link and an inner transverse link parallel thereto, and said arm having an outer portion including an extension of the outer transverse link of the inner portion and supporting, at its outer extremity, a holder for a load, the improvement comprising means for adjusting the joint between the inner transverse link and a first of said longitudinal links relative to said apparatus head by shifting said joint in a substantially vertical direction; a follower spaced from the joint associated with the inner transverse link and arranged on the second of said longitudinal links; and means for guiding said follower along a substantially horizontal path once the arm is swung, said follower being located on a straight line through the outer extremity of the outer portion and the adjustable joint.

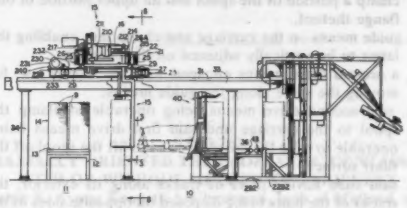
3,995,757

MACHINE FOR FEEDING STACKED ARTICLES

Kenneth R. Runyan, Dayton; Quentin E. Honnert, Cincinnati, and Ronald H. Porter, Milford, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Division of Ser. No. 437,167, Jan. 28, 1974, Pat. No. 3,907,273. This application June 27, 1975, Ser. No. 590,951
Int. Cl.² B65G *47/61*
U.S. Cl. 214—309 **7 Claims**

1. A crane assembly for removing a stack of articles from a pallet which comprises a carriage mounted for movement above the pallet toward and away from the pallet lengthwise of slots in the pallet, a crane member including an upright frame extending downwardly from the carriage and forks mounted at the lower end of the upright frame perpendicular thereto, the forks being spaced to enter the slots in the pallet underlying the stack, a table having spaced conveyor belts adjacent the pallet, a pair of vertically spaced substantially horizontal links, means pivotally connecting one end of each of the links to the upright frame, means for pivotally connecting an opposite end



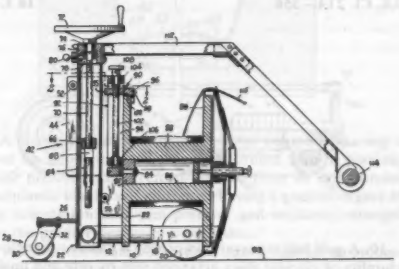
of each of the links to the carriage, cam means engaging one of the links, means for turning the cam means to cause raising of the links and of the crane member when the forks underlie the stack to raise the stack from the pallet, means for moving the carriage to advance the crane member from the pallet to a deposit position overlying the table, and means for lowering the crane member to permit the forks to enter between the conveyor belts to deposit the stack on the conveyor belts.

3,995,758

SPOOL-HANDLING DOLLY

Joseph J. Kovaleski, c/o Wyrepak Industries, Inc., 136 James St., Bridgeport, Conn. 06604

Filed Mar. 31, 1975, Ser. No. 563,792
Int. Cl.² B60B *29/00*; B65G *47/00*; B21C *47/24*
U.S. Cl. 214—330 **2 Claims**



1. A spool-handling dolly comprising, in combination:

a. a chassis including wheels for moving the chassis over a floor surface,

b. said chassis including an upright slide in the form of a box section provided with vertical slots and constituted of two channels having vertical abutting edges welded together along central portions of the box section,

c. a carriage vertically movable along said upright slide and constituted of a pair of spaced-apart metal plates disposed on opposite sides of the slide, and further constituted of tie rods extending between and connected with said metal plates, said tie rods being disposed exteriorly of said slide,

d. a first drive means on the chassis, for raising and lowering said carriage, said first drive means comprising an upright screw extending within the slide, and a nut threaded on the screw,

e. a lift shoulder carried by the carriage and adapted to be

inserted in the bore of a filled spool located with its flanges resting on the floor surface,

f. an arm carried by the chassis and extending over the lift shoulder,

g. a pay-off pulley mounted at the end of the arm in registration with the lift shoulder,

h. a clamp jaw on the carriage, disposed above said lift shoulder and adapted to cooperate with the same to clamp a portion of the spool and an upper portion of one flange thereof,

i. guide means on the carriage and clamp jaw, enabling the latter to be vertically adjusted on the carriage,

j. a second drive means engaged with the clamp jaw, for moving the same along the guide means,

k. said second drive means being operable to clamp the spool to the carriage and said first drive means being operable to raise the carriage so as to lift the spool off the floor surface,

l. said slide having pairs of tracks along its exterior, the tracks of the pairs being disposed on opposite sides of the vertical, abutting welded edges of the slide,

m. said carriage having a pair of rollers on its upper portion, engaged with two of said tracks, and having a pair of rollers on its lower portion, engaged with the other two tracks, said pairs of rollers being carried on said tie rods,

n. said first drive means further including tie members extending through the vertical slots of the slide and connected with said metal plates and with said nut to transmit motion from the latter to said carriage,

o. said first drive means including a drive collar attached to said nut and encircling said screw.

3,995,759

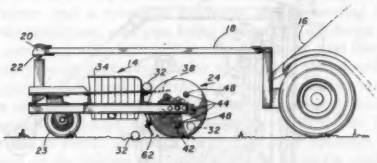
GOLF BALL RETRIEVER

Richard H. Hollrock, and John R. Hollrock, both of 51 Longview Drive, Simsbury, Conn. 06070

Filed June 13, 1975, Ser. No. 586,736

Int. Cl.² B60P 1/00

U.S. Cl. 214—356 **16 Claims**



10. A golf ball retriever comprising a picker roll including a plurality of circular discs arranged side by side and uniformly spaced one from the next along a common central axis, a frame, and means supporting said picker roll for rotation relative to said frame about said central axis, each of said circular discs of said picker roll being made of sheet material and having two flat faces, the spacing between said discs being slightly less than the diameter of the golf balls with which said retriever is to be used, and a plurality of elongated guides carried by said frame and each associated with a respective one of said discs, means mounting each of said guides to said frame so as to have a normal position relative to said frame and so as to be yieldably movable from said normal position by contact with a ball of the type with which said retriever is to be used, each of said guides in its normal position having its longitudinal axis located in the plane of its associated disc and having an upper end located adjacent said frame and a free lower end, said guides in their normal positions defining openings therebetween having dimensions less than required for the free passage therethrough of balls with which the retriever is to be used.

3,995,760

MOTOR VEHICLE CONSTRUCTION

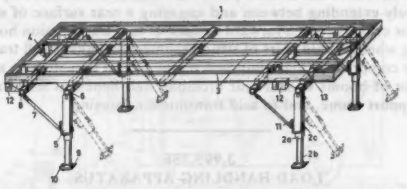
Günter Burgdorf, Stockheim, and Klaus Egger-Büssing, Braunschweig, both of Germany, assignors to H. Bussing & Sohn, Braunschweig, Germany

Filed Apr. 16, 1975, Ser. No. 568,581

Claims priority, application Germany, Apr. 27, 1974, 2420603

Int. Cl.² B60P 1/64

U.S. Cl. 214—515 **9 Claims**



1. In a motor vehicle movable forwardly and backwardly in a normal direction of travel, the combination comprising: a load-supporting horizontal base frame elongated in said direction and having relative to said direction a front end portion and a rear end portion; a plurality of elongated support legs on said frame each having an upper end pivoted on said frame and a lower end engageable with the ground, each of said legs being pivotal on said frame between a support position with its lower end standing on the ground and extending generally vertically between said base frame and the ground, and a loading position with its lower end behind its upper end and engaging the ground and extending backwardly in said direction from said base frame; a curved downwardly convex plate on each of said lower ends; mounting means on said base frame for movement of each of said legs horizontally transverse to said direction; a vehicle-mountable chassis frame having a front end portion and a rear end portion, said rear end portion of said chassis frame forming a pair of interengageable - portions with and being engageable under the front end portion of said base frame on displacement of said chassis frame backwardly in said direction relative to and under said base frame; at least one of said interengagable portions being formed with a ramp engageable with the other of said interengagable portions, whereby movement of said chassis frame underneath said base frame is facilitated; an abutment of said base frame extending downwardly therefrom; a traverse support on said chassis frame having a rearwardly facing surface engageable with said abutment on backward displacement of said chassis frame relative to said base frame to simultaneously displace said base frame backwardly and pivot said legs from said loading into said support positions; and means at each of said legs for locking same in said support position after pivoting of the respective leg from said loading into said support position.

3,995,761

ANTI-LOWERING DEVICE FOR A BOOM LOADER

Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 4, 1975, Ser. No. 610,368

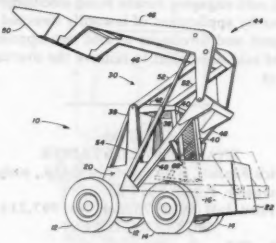
Int. Cl.² E02F 3/16

U.S. Cl. 214—776 **9 Claims**

1. An improved anti-lowering device for a boom loader having a frame including upwardly-extending laterally-spaced side members, a boom structure including a pair of arms and means for pivotally mounting said boom structure to the frame, and power means operably associated with said boom structure for raising and lowering in concert each of said arms along a path adjacent a corresponding side member, said anti-lowering device comprising:

a. a stop member including a cam surface and an abutment surface;

b. means for mounting the stop member at a predetermined height on one of the side members of the frame so that said abutment surface faces generally upwardly;
c. means for moving said stop member relative to said side member between a locking position and a retracted position;
d. means acting upon said moving means for biasing said stop member in the locking position with its abutment



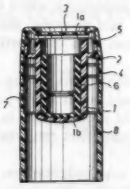
surface projecting outwardly from said side member into the path of travel of the corresponding arm so that said arm may be lowered into supporting engagement with said abutment surface to prohibit movement of said boom structure beyond a given height; and
e. said biasing means yieldable to permit said stop member to be urged to said retracted position under conditions where said arm is raised upwardly into engagement with said cam surface.

3,995,762

BOTTLE STOPPER MEANS FOR WINE BOTTLES

Hans O. Pfefferkorn, Beehovenstr. 19, Simmern; Bernd Pfefferkorn, Gass 9, Kulz, and Viktor H. Reiter, An der Schneiderburg, Simmern, all of Germany

Filed Mar. 24, 1976, Ser. No. 670,338
Int. Cl.² B65D 41/52
U.S. Cl. 215—256 2 Claims



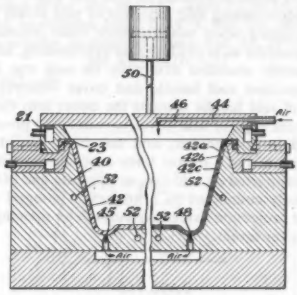
1. Stopper means for closing wine bottles and like receptacles including
a. an elongated stopper body of synthetic flexible material adapted for insertion into the neck of a bottle so as to seal said neck;
b. said stopper body having an upper integral annular flange portion of increased diameter fluted on the radially outer surface and said stopper body further defining a cavity open at the upper end and closed at the lower end thereof;
c. an elastomeric gas-tight stopper insert placed into and closely fitting said cavity; and
d. an outer cap engaging said upper portion of said stopper body, said outer cap being of relatively small diameter and of a resilient material adapted to be expanded and mounted on a neck of relatively large diameter of a bottle and then to contract to said relatively small diameter, said outer cap including a system of flutes engaging said fluted portion of said stopper body so as to preclude any rotary motion of said outer cap relative to said stopper body, and said outer cap further including a readily removable strap portion adapted to readily sever said outer cap in transverse direction to allow joint removal of said stopper body, said stopper insert, and said fluted portion of said cap.

3,995,763

BIAXIALLY ORIENTED THERMOPLASTIC CONTAINER WITH OR WITHOUT MOLDED TIP PERIPHERY

Ralph E. Ayres; Kenneth J. Cleereman, both of Midland, and Walter J. Schrenk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

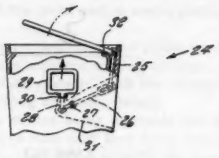
Continuation of Ser. No. 389,921, Aug. 20, 1973, abandoned, which is a division of Ser. No. 295,092, Oct. 2, 1972, abandoned, which is a division of Ser. No. 62,969, Aug. 11, 1970, Pat. No. 3,739,052. This application May 27, 1975, Ser. No. 581,295
Int. Cl.² B65D 1/02; B32B 1/04
U.S. Cl. 220—74 14 Claims



1. A biaxially oriented thermoplastic container having a molded lip about its periphery and formed from a biaxially oriented preform, said preform formed from an unexpanded thermoplastic blank, said container having a greater degree of biaxial orientation than said preform and improved strength due to the greater degree of orientation.

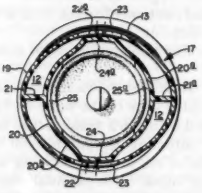
13. An oriented container formed from a high speed process comprising the steps of:
a. providing a thermoplastic blank of material sufficient for an article,
b. providing lubrication for said blank sufficient to permit substantial plug flow of the same in step (d),
c. bringing said blank to a temperature in a range from just below the softening temperature to about the melting temperature of the material forming said blank,
d. forging said blank by substantial plug flow in a forging mold heated to a temperature at least as high as the softening temperature of the material forming said blank, said blank being forged into a preform having orientation greater than that of said blank,
e. maintaining the center portion of said preform substantially at its forming temperature while the peripheral portion thereof is rapidly brought below the softening point of the material forming said blank,
f. immediately forming said preform into an article having a desired shape and size; and
g. permitting said article to cool.

3,995,764
SELF-CONTAINED GARBAGE CAN COVER
Johnnie Zagami, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Nov. 11, 1974, Ser. No. 522,443
Int. Cl.² B65D 43/16
U.S. Cl. 220—263 1 Claim



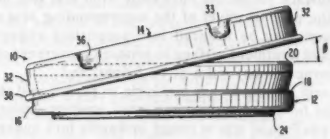
1. In a self-contained garbage can cover assembly, the combination of a garbage can having a top edge about a refuse opening and a cover pivotally connected to said can, said can having a pocket on its side wall into which said cover is fully slidable when said can is in an opened position, said cover having spaced aligned transverse pins projecting laterally therefrom, said pins being slidable in vertical grooves adjacent each side of said pocket, a pair of stops at the upper ends of said grooves against which said pins abut when said cover is fully raised from said pocket, said cover being pivotable about said side pins when in abuttment with said stops, including a shoulder encompassing said top edge of said refuse opening, said cover resting upon said shoulder when pivoted into a horizontal position so as to close said can opening, including a movable handle mounted externally on said can including means connection said handle and cover whereby upward movement of said handle retracts the cover into the pocket, wherein a rear edge of said cover is connected pivotally to a link located in said pocket, said link being pivottally connected to one end of a rocker lever centrally pivotable about a fixed pin supported on said can, an opposite end of said lever being pivotally connected to a projection integral with said handle, said projection extending through an opening through said can rocker lever.

3,995,765
SAFETY CLOSURE FOR CONTAINERS
James E. Burke, Wheaton, Ill., assignor to VCA Corporation, Baton Rouge, La.
Filed Dec. 18, 1974, Ser. No. 533,845
Int. Cl.² B65D 55/02; B67D 5/32; B65D 83/14
U.S. Cl. 220—281 7 Claims



1. A safety overcap for a container comprising:
a. a generally circular top wall;
b. a generally cylindrical outer skirt depending downwardly from said top wall, said outer skirt being provided with two opposed, generally rectangular, longitudinal openings therein extending over a major portion of the length of said skirt, said openings being of sufficient width to receive a portion of the thumb and forefinger of an adult person;
c. an inner skirt depending downwardly from said top wall within said outer skirt, said inner skirt having two opposed pressure panels of a width substantially the same as said two openings and positioned opposite of and slightly recessed from said two openings in said outer skirt whereby pressure may be applied thereto by said thumb and forefinger; and
d. engaging means on said inner skirt adjacent its lower end adapted to engage said container to retain said overcap thereon, said engaging means being disengaged from said container by application of inwardly directed force from said thumb and forefinger to said two opposed pressure panels of said inner skirt to remove the overcap from the container.

3,995,766
SNAP-OPEN CONTAINER
Jack Frederick Fralick, Havre de Grace, Md., assignor to Kiwi Polish Company, Pottstown, Pa.
Filed July 18, 1975, Ser. No. 597,214
Int. Cl.² B65D 43/04
U.S. Cl. 220—282 10 Claims

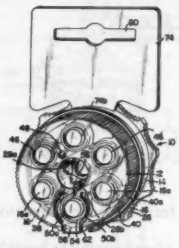


1. A package for a semi-solid material such as shoe polish comprising,
a cylindrical polish-containing body formed of a circular base and an annular wall extending upwardly thereabout,
a first annular rim about the upper end of said wall forming an access opening, said wall having an annular depression between said bottom and said first rim, said first rim having an upper surface,
a cover having a top portion,
a skirt extending downwardly from the periphery of said top portion and terminated by a second annular rim that is in the plane of said depression when said cover is in closing relationship with said opening, the inner surface of said skirt forming a seal with the portion of said wall above said depression,
first and second indentations having bottom and inner surfaces formed in said cover at the juncture of said top and said skirt and said indentations in engagement with the upper surface of said first rim when said cover is in said sealed position,
a line intersecting said indentations defining a pivot axis, said indentations subtending an angle with respect to the geometrical center of said circular cover such that the inner surfaces of said indentations snuggly engage a portion of said first rim when said cover is tilted about said pivot axis.

3,995,767
BATTERY DISPENSER
Robert E. Brindley, New York, N.Y., and Francis Stahl, St. Albans, Vt., assignors to Union Carbide Corporation, New York, N.Y.
Filed Oct. 15, 1975, Ser. No. 514,732
Int. Cl.² B65D 85/42
U.S. Cl. 221—82 15 Claims

1. Battery dispenser comprising: in combination, first and second casing members which co-fit together to define an enclosure for storing a plurality of small, miniature button cell batteries; means for rotatably mounting said first casing member to said second casing member; means cooperating with

said second casing member for holding said plurality of batteries spaced apart from one another and for defining a predetermined number of compartments with each compartment adapted to hold one of said batteries; said first casing member including a series of openings in one wall thereof which register with said predetermined compartments so as to expose one terminal surface of each of said batteries at one end thereof for contact by a first voltmeter test probe; a conductor element positioned internal of said enclosure and having a first



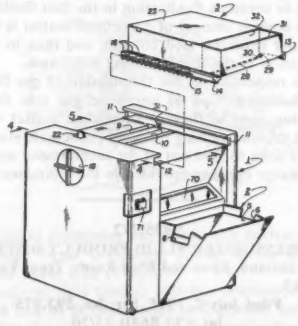
section in electrical contact with the terminal surface of each battery at the opposite end thereof; aperture means located in one wall of one of said first and second casing members and arranged relative to a second section of said conductor element for providing direct access to said conductor element internal of said enclosure by a second voltmeter test probe independent of the relative position between said first and second casing members, and a discharge outlet located in said first casing member for dispensing each battery.

3,995,768

CARTRIDGE FOR APPARATUS FOR DESTROYING SYRINGES AND LIKE ARTICLES

Anthony P. Montalbano, Glencove, N.Y., and Erich Emil Hensel, Wassenaar, Netherlands, assignors to Madeline Ippolito, Great Neck, N.Y.

Division of Ser. No. 411,829, Nov. 1, 1973, Pat. No. 3,929,295. This application May 23, 1975, Ser. No. 580,478
Int. Cl.² B65H *1/00*
U.S. Cl. 221—197 **10 Claims**



1. A cartridge arrangement for containing a plurality of syringes, or like objects, for selective insertion of said syringes into a destruction mechanism of a destruction device, comprising:

a cartridge body adapted to be movably mounted to said destruction device, and including means defining a plurality of chambers therein, each chamber retaining at least one syringe; and

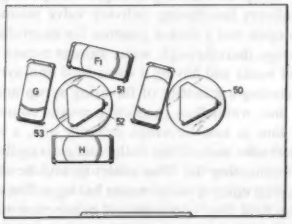
a slideable base member mounted to said cartridge body for selective sliding relative to said cartridge body for selectively opening said chambers to deposit syringes from the selectively opened chambers into said destruction mechanism, said slideable base member including means engageable with said destruction device for opening said chambers upon advancing movement of said cartridge body relative to said destruction device.

3,995,769

FUEL DISPENSING AND MEASURING DEVICE ARRANGED ON GROUND SURFACE

Etsuo Kuwabara, Funabashi; Masamitu Tadano, Yokohama; Mitsuo Horiuchi, Yokohama; Makoto Yoda, Yokohama; Saburo Ishida, Yokohama; Astushi Toba, Kawasaki; Susumu Ohhashi, Tokyo; Yoshiro Iwano, Kawasaki; Kazuo Sasaki, Kawasaki; Mitsuo Iwano, Kawasaki, and Hiyoshi Tatsuno, Tokyo, all of Japan, assignors to Nippon Oil Company Ltd. and Tokyo Tatsuno Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 460,157, April 11, 1974, abandoned. This application July 11, 1975, Ser. No. 595,246
Claims priority, application Japan, Apr. 13, 1973, 48-41979
Int. Cl.² B67D *5/22*
U.S. Cl. 222—26 **4 Claims**

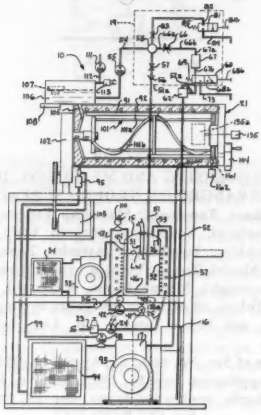


1. A fuel dispensing device mounted on a ground surface comprising a fuel dispensing structure, said structure including a base, a head, and an upright member connecting said head to said base, said head being a hollow member of substantially prism-like form having a horizontal cross sectional area generally in the form of a triangle to thereby form three sides on said head, three indicating means in said head driven by a common source for indicating the amount of fuel dispensed with one indicating means being located on each one of said sides of said head whereby the amount of fuel dispensed can be read from at least one of said three indicating means from any position on a 360° circle about said structure, said base being a pedestal of a substantially circular horizontal cross section mounted directly on said ground surface as an exclusive island for the fuel dispensing device, said base occupying a relatively small amount of surface area such that vehicles may park at various angles around said base, said upright member comprising a tubular element secured to said base and to said head to thereby mount said head on said base, said upright member having a cross sectional area less than the cross sectional area of said base and less than the cross sectional area of said head, nozzle means mounted on said head for dispensing fuel therethrough, and transfer means in said structure for transferring fuel to said nozzle means.

3,995,770
APPARATUS FOR DISPENSING BEVERAGES

Steve W. Schwitters, Rockford, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Mar. 19, 1975, Ser. No. 559,697
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² B67D 5/56, 1/08
U.S. Cl. 222—56 20 Claims

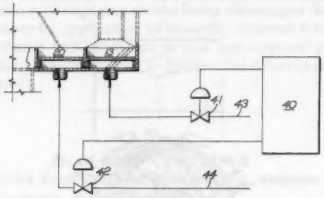


1. An apparatus for dispensing beverages containing water, a flavoring syrup and food-grade gas comprising, a mixed beverage delivery line having delivery valve means movable between an open and a closed position for controlling flow of mixed beverage therethrough, water storage means for storing a quantity of water and having a water feed line, syrup storage means for storing a quantity of flavoring syrup and having a syrup feed line, water flow restricting means connecting said water feed line to said beverage delivery line, a syrup filter having a filter inlet and a filter outlet and a syrup flow restricting means connecting the filter outlet to said beverage delivery line, a syrup control valve means having a first connection to said syrup feed line; and a second connection to said filter inlet and a drain connection, said syrup control valve means including means selectively movable from a normal position communicating said first connection with said second connection while blocking flow through the drain connection and a back flush position blocking flow through the first connection while communicating the second connection with the drain connection, gas pressurizing means including a source of food-grade gas for supplying gas under a preselected substantial constant pressure to said gas inlet of said water storage means to feed water under the gas pressure through the water feed line and water flow restricting means to the beverage delivery line, said gas pressurizing means including means for supplying gas under substantially the same preselected pressure to said gas inlet of said syrup storage means to feed syrup under the gas pressure through the syrup feed line and in one direction through the filter and syrup flow restricting means to the beverage delivery line when said syrup control valve is in its normal position, said syrup control valve being operative in its back flush position to block the flow of syrup from the syrup feed line and to communicate the filter inlet with the drain connection whereby water under the gas pressure from the water feed line will flow in the other direction through the syrup flow restricting means and syrup filter to drain to back flush the same.

3,995,771
FEEDING DEVICE FOR PARTICULATE MATTER

Charles D. Olivier, New Orleans, La., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed May 19, 1975, Ser. No. 578,860
Int. Cl.² B67D 5/08
U.S. Cl. 222—61 12 Claims



1. A device for feeding discrete quantities of particulate matter comprising

a. a substantially closed container provided with a conduit for feeding particulate matter into the container, the discharge end of said conduit extending into the inner peripheral area of the container;

b. a first fluidizing zone disposed beneath the discharge end of the feed conduit which receives particulate matter from the feed conduit and allows an unfluidized mass of particulate matter to build up to the discharge end of the conduit, thereby terminating the further feeding of particulate matter from the feed conduit, the distance between the first fluidizing zone and the discharge end of the conduit being such that the first fluidizing zone is essentially covered with unfluidized particulate matter upon the termination of particulate feeding from the conduit due to particulate build-up thereto;

c. a second fluidizing zone disposed adjacent the first fluidizing zone which receives particulate matter from the first zone;

d. means to introduce gas into the first fluidizing zone to fluidize particulate matter therein, causing fluidized particulate matter to flow out of the first fluidizing zone into the second fluidizing zone and causing additional particulate matter to be fed from the feed conduit to the first fluidizing zone, said fluidizing means provided with means to continue fluidization in the first fluidizing zone until a desired amount of particulate matter is fed to the container from the feed conduit, and then to terminate fluidization in the first fluidizing zone; and

e. means responsive to the termination of gas flow in the first fluidizing zone to introduce gas into the second fluidizing zone to fluidize particulate matter which has settled therein, causing fluidized particulate matter in the second zone to flow out of the second zone and through a discharge opening provided in the container.

3,995,772
NON-PRESSURIZED FLUID PRODUCT DISPENSER

James P. Liautaud, River and Bluff Roads, Trout Valley, Cary, Ill. 60013

Filed July 7, 1975, Ser. No. 593,575
Int. Cl.² B65D 35/20
U.S. Cl. 222—83.5 6 Claims

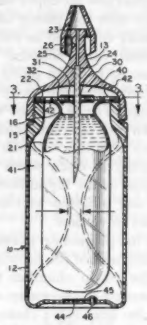
1. A non-pressurized dispenser comprising, in combination:

a pressure-tight housing including a body portion having compressible side walls and an opening at one end thereof, and a removable cap portion adapted for threaded engagement to said body portion over said opening, said cap portion having a product dispensing nozzle therein;

check-valve means in said housing for allowing air to enter

said housing in the absence of a positive pressure differential therein;

a compressible product container disposed within said housing, said container having a relatively flexible bag portion within said body portion and a relatively inflexible flange portion at one end of said bag portion adapted to fit over said opening under said cap portion, said flange portion being manipulated in a seated position against the rim of



said opening by said cap portion and including a relatively thin membrane portion serving as a sidewall for said bag portion; and

means including a hollow needle in said cap portion having a passageway communicating with said nozzle for penetrating said membrane portion when said cap portion is installed on said body portion whereby the product in said container is dispensed when said housing is compressed.

3,995,773

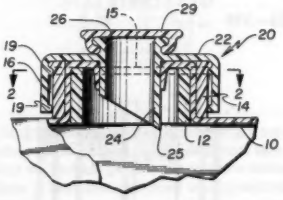
FLEXIBLE LIQUID CONTAINING AND DISPENSING DEVICE

Justin M. Schmit, Pompano Beach, Fla., assignor to Arctic Pac, Inc., Fla.

Continuation-in-part of Ser. No. 448,617, March 6, 1974. This application Dec. 17, 1975, Ser. No. 641,660

Int. Cl.² B67B *7/28*

U.S. Cl. 222—91 **11 Claims**



1. In a liquid containing and dispensing device,

a. a sealed liquid containing pouch having at least one flexible upper wall portion;

b. a relatively rigid tubular member positioned within the pouch and its flexible upper wall portion and being secured to the wall portion with the latter extending across one end of the tubular member in a sealing relation;

c. sleeve means positioned around the rigid tubular member with the flexible upper wall portion of the liquid containing pouch thereon and securing the tubular member in the upper wall portion of the liquid containing pouch;

d. a pouring structure including an inwardly extending tubular piercing element and mounting means carrying the same with the mounting means being fitted over the sleeve means in interengaging and telescopic relation;

e. said piercing element of said pouring structure piercing the flexible wall portion of said pouch when so mounted and extending into the tubular member to thereby bring the pouring structure into fluid communication with the interior of the pouch to facilitate pouring of the liquid from said pouch outwardly through the pouring structure; and,

f. said mounting means and said sleeve means being so constructed and arranged as to permit relative interengaging and telescopic movement to cause the piercing element to secure the flexible wall portion of the pouch.

3,995,774

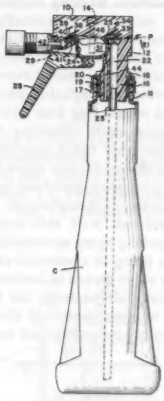
LIQUID DISPENSER HAVING DEFORMABLE DIAPHRAGM TYPE PUMP

Rex C. Cooprider, Hacienda Heights, and Richard P. Grogan, Ontario, both of Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,926

Int. Cl.² B05B *11/01*

U.S. Cl. 222—207 **9 Claims**



1. In a dispensing pump of the class in which a resiliently deformable diaphragm clamped between opposing pump housing members of the pump housing cooperates with one of said members to define a variable volume pump chamber in which inlet and outlet passages formed in said pump housing define a discharge path for liquid from a supply container through said pump chamber to a discharge nozzle, said diaphragm including an endless resiliently deformable marginal flange clamped in fluid tight manner betwen said housing members and encircling said pump chamber;

the improvement in accordance with which said flange includes flap valves constituting unitary portions thereof, said flap valves extending across and normally closing the respective inlet and outlet passages, there being apertures through said flange adjoining and defining free edges of the respective flap valves to permit flow of liquid through said passages when the valves are unseated;

said housing members respectively providing sets for the respective valves on the upstream sides of said valves with reference to the flow of liquid from said supply container toward said discharge nozzle;

the said passages respectively including recesses on the downstream sides of said valves positioned to permit unseating of said valves responsive to liquid pressures thereagainst in a downstream direction;

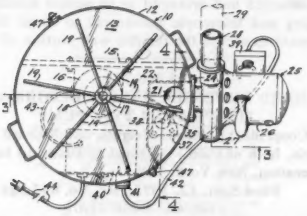
and an operating lever fulcrumed to one of said housing members and having a portion movable through an opening in one said members into operative deforming engagement with said diaphragm to vary the volume of said pump chamber.

3,995,775

CELLULOSIC INSULATION BLOWING MACHINE

Paul J. Birkmeier, and Franklin E. Spieles, both of Delphos, Ohio, assignors to U.S. Fiber Corporation, Delphos, Ohio

Filed July 9, 1975, Ser. No. 594,563
Int. Cl.² B65D 83/06
U.S. Cl. 222—193 7 Claims



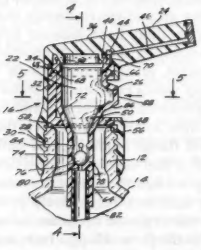
1. A cellulosic insulation blowing machine comprising, in combination, a base including a generally horizontal floor plate and defining a material opening adjacent the periphery of said base floor plate, an agitator assembly having a plurality of generally horizontally and radially extending cross arms, motor means for driving said agitator assembly, said motor means being mounted within said base below said floor plate and including an output shaft extending through said floor plate, said agitator assembly being mounted for rotation on said output shaft, at least one blower assembly in communication with said material opening, said base including a side wall having an opening defined therethrough, a closed housing mounted adjacent said side wall, said material opening and said base side wall opening being surrounded by said housing, said blower assembly being in communication with said base side wall opening, air valve means in communication with said housing for introducing atmospheric air to said housing, a generally cylindrical hopper positioned above said floor plate and means for removably mounting said hopper on said base.

3,995,776

DIRECT FINGER ACTUATED PUMP

Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.

Filed Sept. 16, 1975, Ser. No. 613,820
Int. Cl.² B65D 37/00
U.S. Cl. 222—207 12 Claims



1. A liquid dispensing pump for use and incorporation on a container for liquid to be dispensed comprising in combination:

a component retaining body having an upper end and a lower end and having a lateral opening;

a tubular member carried by said body having a flexible wall defining a variable volume pump chamber adapted to assume a fully distended position of maximum volume and a collapsed position of lesser volume, a lateral bulbous projection portion of the tubular member extending through the opening of the retaining body so that the bulbous projection can be manually and digitally engaged and depressed through the opening in the retaining body thereby decreasing the volume in the pump chamber and when the bulbous projection is released it will return through the opening to its initial position and return the pump chamber to its initial fully distended position of maximum volume;

a lower liquid inlet port and an upper outlet port both being in communication with the pump chamber and having, respectively, an inlet valve and an outlet valve associated therewith, said inlet valve adapted to be closed when liquid to be dispensed is in the pump chamber and when it is dispense therefrom as the pump chamber decreases in volume and adapted to be opened when the liquid to be dispensed is drawn into the pump chamber from the inlet port as the pump chamber volume increases and said outlet valve adapted to open when the pump chamber decreases in volume as the liquid therein is dispensed out the outlet port and adapted to close when the pump chamber increases in volume;

digital actuation of the projection portion permitting movement of the flexible wall of the tubular member to reduce the volume of the pump chamber thereby pressurizing liquid to be dispensed in the pump chamber and, at the same time, with the inlet valve closed, causing the outlet valve to open whereupon the liquid in the pump chamber is adapted to flow into the outlet port and be dispensed therefrom; and

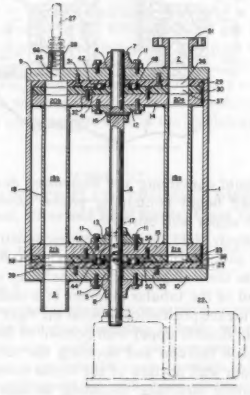
release of the projection portion permitting the tubular member to return to and resume its starting position permitting the volume of the pump chamber to increase thereby lowering the pressure in the pump chamber and, at the same time, with the outlet valve closed, causing the inlet valve to open whereupon the liquid to be dispensed is drawn through the inlet port into the pump chamber until the flexible wall of the tubular member reaches its distended position whereupon the inlet valve closes to trap the liquid to be dispensed in the pump chamber.

3,995,777

GATLING VALVE

Jerry Diez, 317 W. Ascension, Gonzales, La. 70737, and Wayne B. Summers, 13715 Calcasien Drive, Baton Rouge, La. 70805

Filed Aug. 6, 1975, Ser. No. 602,239
Int. Cl.² G01F 11/10
U.S. Cl. 222—370 1 Claim



1. A valve means which comprises:

a. a casing having a top and bottom wall;

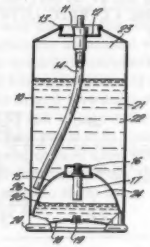
b. an axle secured to said walk by means allowing rotation of said axle;
c. a drive means attached to said axle to cause rotation of said axle;
d. an assembly of receiving chambers attached to said axle in a manner to rotate with said axle, said assembly having top and bottom plates attached to either end of receiving chambers, said plates and chambers having aligned passageways which at different times during rotation about said axle are aligned first with an inlet opening in said top wall and then, after rotation, aligned with an exit opening in said bottom wall, said plates having solid members that seal off said inlet and exit openings when no passageway is aligned with them; and
e. liners constructed or material having a low coefficient of friction and attached on each of said top and bottom walls and said top and bottom plates, said top wall liner being in contact with said top plate liner and said bottom wall liners being in contact with said bottom plate liner, each of said liners having openings aligned with said openings of said wall or plate to which said liner is attached; said adjacent liners having aligned recesses that form circular cavities about said axle in which is positioned a bearing collar means having bearings contacting walls of said recesses.

3,995,778

AEROSOL DISPENSING DEVICE

Rustom Kooverji Gamadia, London, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 428,991, Dec. 27, 1973, abandoned, which is a continuation of Ser. No. 243,138, April 12, 1972, abandoned. This application Apr. 28, 1975, Ser. No. 572,483
Claims priority, application United Kingdom, Apr. 23, 1971, 11051/71
Int. Cl.² B65D *83/14*
U.S. Cl. 222—399 2 Claims



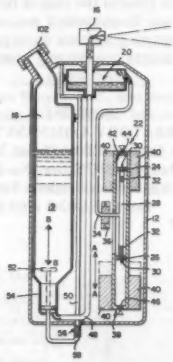
1. An aerosol dispensing device comprising a top outer wall, a bottom outer wall, a substantially cylindrical side outer wall, and an interior wall which divides the interior aerosol dispensing device into a first compartment and a second compartment wherein:
a. the first compartment contains a substance to be dispensed and a liquefiable gas propellant in vapour phase;
b. a dispensing valve extending through an outer wall interconnecting the first compartment and the atmosphere;
c. the second compartment having an inlet through an exterior wall for introduction of a liquefied gas propellant, the second compartment containing liquefied gas propellant in liquid and vapour phase; the vapour pressure in the second compartment being higher than the vapour pressure in the first compartment; and,
d. a communicating valve extending through the interior wall interconnecting the first and second compartments, the communicating valve permitting the passage of vapour phase propellant from the second to the first compartment while preventing passage of liquid phase propellant from the second to the first compartment; the communicating valve comprising an open ended tube extending from the interior wall part way into the first compartment and part way into the second compartment, the amount of liquid propellant in the second compartment and the extension of the communicating valve from the interior wall into the second compartment being such that the open end of the communicating valve in the second compartment is always above the levels of the liquefied gas propellant whatever the position of the device; and the communicating device having a resillient member which completely circumnavigates the communicating valve in the first compartment and holds the communicating valve closed except when the gas pressure difference between the first and the second compartments rises to a predetermined level following dispensation of the substance from the first compartment.

3,995,779

AEROSOL CONTAINER

John V. Mizzi, Poughkeepsie, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 17, 1976, Ser. No. 667,710
Int. Cl.² B65D *83/14*
U.S. Cl. 222—401 8 Claims



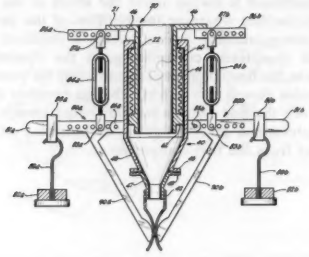
1. An aerosol container comprising in combination:
a housing;
a manually operable discharge valve carried by said housing and adapted to selectively dispense a pressurized liquid therefrom;
a reservoir mounted within said housing for the storage of the liquid to be dispensed;
a chamber mounted within said housing adapted to contain a supply of pressurized air;
air pump means mounted within said housing and adapted to develop a supply of pressurized air upon oscillatory motion of the container;
conduit means for conveying pressurized air from said air pump means to said chamber;
and means for withdrawing liquid from said reservoir and conveying same to said discharge valve and for dispensing same from said discharge valve under the influence of the pressurized air in said chamber.

3,995,780

PRESSURE-RESPONSIVE VALVE MECHANISM

William E. Showalter, Seal Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Oct. 23, 1975, Ser. No. 625,127
Int. Cl.² B65D 45/32
U.S. Cl. 222—494 8 Claims



1. A valve for discharging a slurry of reduced fluid content from the bottom of a solids-liquid separator comprising:

an outlet duct in communication with the interior of said solids-liquid separator and having a discharge tip for the discharge of said slurry from said separator, said duct being axially movable with respect to said separator in response to a force imparted thereto by the collection of said slurry therein;

a constrictable nozzle at said discharge tip of said outlet duct; and

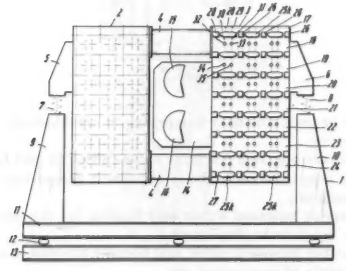
external flow control means for variably constricting said nozzle responsive to the axial movement of said outlet duct thereby to control the rate of flow of slurry through said nozzle, said flow control means including biasing means for imparting a force to urge said flow control means into a nozzle constricting position.

3,995,781

VIBRATORY COMMINUTOR

Friedrich Wilhelm Nette, Sachsenstrasse 26, Hosel, Germany

Filed Jan. 13, 1975, Ser. No. 540,823
Claims priority, application Belgium, Jan. 11, 1974, 139711
Int. Cl.² B02C 1/00
U.S. Cl. 241—147 12 Claims



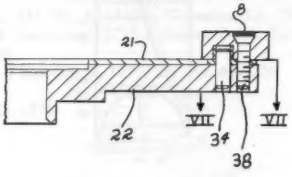
1. A vibratory comminutor, comprising a container for material to be comminuted, said container including a plurality of vertically spaced comminuting zones; a plurality of first comminuting elements rigidly mounted in said container and arranged so that at least one of said first comminuting elements is located in each of said comminuting zones; a plurality of second comminuting elements movably mounted in said container and arranged so that at least one of said second comminuting elements is located in each of said comminuting zones and confronts a respective one of said first comminuting elements, said second comminuting elements each having an upper side and a lower side, and said second comminuting elements being elongated and each having a longitudinal center line, said second comminuting elements having a rest position and another position in which said second comminuting elements cooperate with the respective first comminuting elements to comminute material; means for vibrating said second comminuting elements; and resiliently yieldable mounting means engaging said second comminuting elements and mounting the latter for movement relative to the respective first comminuting elements in such a manner that, when said vibrating means is operative, the motion of said second comminuting elements is essentially linear and essentially follows the path on which the respective rest position and other position are located, said mounting means comprising spring means engaging said upper side and said lower side of each of said second comminuting elements, and said spring means including, for each second comminuting element, a set of springs having a first plurality of springs which engage the upper side and a second plurality of springs which engage the lower side thereof, the springs of each plurality engaging said second comminuting elements on said center lines and being spaced from one another lengthwise of said center lines.

3,995,782

PULVERIZING DEVICE

Dennis J. Shallenberger, Latrobe, and Charles E. Hill, Whitney, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 22, 1975, Ser. No. 579,843
Int. Cl.² B02C 13/14
U.S. Cl. 241—188 R 10 Claims



1. In a comminution machine having a cylindrical housing, a pulverant inlet means for receiving material to be pulverized, a disc-like rotor, rotatable on an axis in the housing, hammers located on one side of the disc-like rotor near the periphery and a housing liner located on the inside of the housing and surrounding the disc-like rotor, the improvement which comprises a sheet of cemented hard carbide material which is thin relative to the disc-like rotor's thickness securely fastened to the said one side of said rotor beneath said hammers, said sheet divided into parts along a plane of a diameter of the rotor and having apertures beneath at least one of said hammers, and a metal insert filler in each aperture engaging a radially outward facing edge of the respective aperture to hold the sheet against radial movement on the rotor, a pin in the rotor extending through each aperture and a bore in said metal filler element so as to engage a downwardly opening hole in the respective hammer, and a bolt spaced from each pin and extending downwardly through a bore formed in the respective hammer and threaded into the rotor to clamp the hammer to the rotor.

3,995,783

YIELDABLE SHEAR BAR FOR A FORAGE HARVESTER

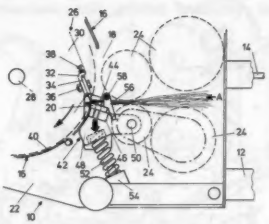
Raymond Bertrand; Claude Barbot, and Robert Guilhermic, all of Senonches, France, assignors to Deere & Company, Moline, Ill.

Filed Sept. 4, 1975, Ser. No. 610,310

Claims priority, application France, Sept. 13, 1974, 74.31114

Int. Cl.² B02C *18/16*

U.S. Cl. 241—222 9 Claims



1. In a forage harvester having a mobile main frame, a cutterhead housing, and an axially transverse rotary cutterhead mounted in the housing and having a plurality of knives generating a cylinder as the cutterhead rotates, the improvement comprising: a shear bar having a straight longitudinal cutting edge disposed forwardly of and adjacent to the cutterhead periphery parallel to the cutterhead axis; means mounting the shear bar on the forage harvester frame for shifting between a normal, undeflected position wherein the cutting edge is disposed immediately adjacent to the cutterhead and a downwardly deflected position wherein it permits the downward tangential discharge of foreign bodies entrained in the crop material before the foreign bodies entirely enter the cutterhead, said mounting means including a pair of parallel arms pivotally mounted on the forage harvester frame on coaxial pivot means and carrying the shear bar and resiliently yieldable means operatively associated with the shear bar for biasing the shear bar toward its undeflected position in all the positions of the shear bar; and a plurality of feed rolls mounted on the frame parallel to and forwardly of the cutterhead and including a lower feed roll adjacent the forward side of the shear bar, when the shear bar is in its undeflected position, the feed rolls being adapted to feed crop material over the shear bar and radially into the cutterhead, the cutterhead knives moving downwardly past the shear bar to reduce crop material moving over the shear bar.

3,995,784

ROTARY MILL FOR MICRONIC GRINDING

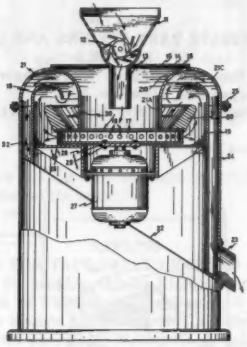
Federico de los Santos Izquierdo, Mexico City, Mexico, assignor to Consejo Nacional de Ciencia y Tecnologia, Mexico City, Mexico, a part interest

Filed Mar. 21, 1975, Ser. No. 560,892

Int. Cl.² B02C *13/09*

U.S. Cl. 241—275 4 Claims

1. A rotary mill comprising a container having an open end; a tubular piece having an end bellmouthed, which bellmouthed end is coupled to the open end of the container; air inlet means coupled to the bellmouthed end of the tubular piece; a hopper coupled to the air inlet means for feeding material into the tubular piece, said hopper including a regulating feed valve; a revolving disc located in that end of the tubular piece opposite to its bellmouthed end; a funnel shaped deflecting piece located around said tubular piece and having one end registering with the revolving disc for feeding semi-ground material thereto; wall means surrounding the revolving disc and the deflecting piece and having one end projected and bent towards the deflecting piece, against which wall means the materials flung from the revolving disc will strike; a circular plate registering with the revolving disc and joined to the wall means, so that material flung from the revolving disc forms a bank in the region of the joint and which circular plate together with the wall means form a first receiving chamber for material not yet fully ground; a first passage defined by the bent projection and the deflecting piece for the semi-ground



material be returned to the revolving disc; a second passage defined by the bent projection and the bellmouthed end of the tubular piece for passing the finely-ground material; a second receiving chamber defined by the wall means and the container to house the finely-ground material from the second passage; and outlet means for the finely-ground material obtained from the second receiving chamber.

3,995,785

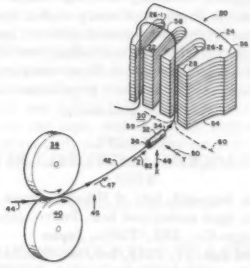
APPARATUS AND METHOD FOR FORMING DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Robert E. Arick, Fort Wayne, Ind., and Ralph A. Vogel, Three Rivers, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 331,992, Feb. 12, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 531,885

Int. Cl.² B21F *3/00*; B65H *81/00*

U.S. Cl. 242—1.1 R 25 Claims



1. Apparatus for placing magnet wire in slots respectively defined by spaced elements extending from a support member thereby to form a dynamoelectric machine field winding, said elements having distal ends, said apparatus comprising means spaced from said distal ends on the side thereof remote from said support member for guiding said wire toward said elements, means for continuously pushing wire through said guide means, and means for moving said guide means, as said wire is being continuously pushed therethrough, relative to

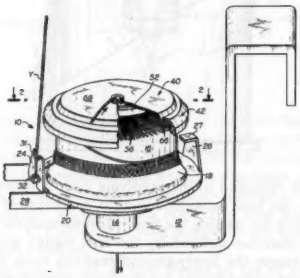
said elements in a path aligned with at least two of said slots and with a motion having components in at least two mutually perpendicular axes thereby continuously to push said wire into said slots without applying tension thereon and to guide the wire as it is being continuously pushed between said slots to form end turns.

3,995,786

INTERMEDIATE YARN FEEDING AND CONTROL DEVICE

Jose Castillo Deniega, Elmhurst, N.Y., assignor to Wesco Industries Corporation, Plainview, N.Y.

Filed Jan. 15, 1975, Ser. No. 541,120
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.01 **43 Claims**



1. In a yarn feeding device wherein yarn windings are formed on a storage member adjacent one end thereof and the yarn is thereafter withdrawn therefrom adjacent the other end thereof, means for imparting preselcted tension to the yarn being withdrawn comprising,

a. a plurality of resilient fingers carried by support means therefor disposed adjacent said other end of said storage member, said fingers extending outwardly of said support means and projecting beyond the outer periphery of said storage member,

b. an outer ring having an inner wall provided with a peripheral seat for receiving the outermost portions of said resilient fingers which constitute the means of support for said outer ring, said outermost portions of said resilient fingers, when the resilient fingers are in relaxed condition, collectively defining a circle whose diameter is greater than the diameter of said peripheral seat therefor,

c. the withdrawn yarn being passed between said outer ring and the outer periphery of said storage member whereby as the yarn is withdrawn it flexes successive resilient fingers which impart thereto a preselected tension.

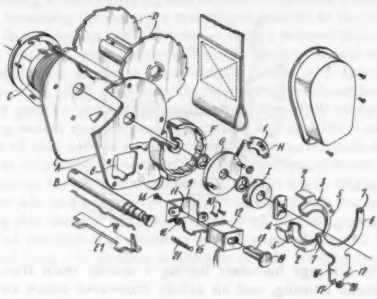
3,995,787

AUTOMATIC LOCKING SAFETY BELT RETRACTOR REEL

Takezo Takada, deceased, late of Hikone, Japan, and by Juichiro Takada, legal authorized heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1975, Ser. No. 546,161
Claims priority, application Japan, Feb. 4, 1974, 49-13628
Int. Cl.² B65H *25/48*
U.S. Cl. 242—107.4 B **7 Claims**

1. An automatic braking safety belt retractor comprising a belt reel rotatable in opposite belt extraction and retraction directions, spring means urging said reel to rotate in a belt retraction direction, a shaft rotatable with said reel, braking means transferrable between advanced and retracted positions respectively braking said reel against belt extraction rotation and releasing said reel, a first ratchet wheel rockable on said shaft between advanced and retracted positions and coupled to said braking means to respectively transfer said braking means to its advanced and retracted positions, an inertia wheel rotatable on said shaft, a first pawl member eccentrically swingably mounted on said inertia wheel and movable to advanced and retracted positions respectively in and out of engagement with said first ratchet wheel and spring urged to a ratchet wheel disengage position, and having a first follower portion, a cam carried by said shaft and engaging said first follower portion to advance said first pawl member to its



ratchet engage position in response to said inertia wheel lagging said cam in rotation whereby to advance said ratchet wheel, and characterized in the provision of means for deactuating said first pawl member comprising an annular retractor member coaxial with said inertia wheel and axially movable between an advance position in which said retractor member engages said first pawl member and retains it in its retracted position and a retracted position releasing said first pawl member for movement into engagement with said first ratchet wheel.

3,995,788

VEHICLE SENSITIVE RETRACTOR WITH IMPROVED UNIVERSAL PENDULUM AND GIMBAL

Robert L. Stephenson, Sterling Heights; Robert C. Pfeiffer, Rochester, and Yogendra Singh Loomba, Washington, all of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

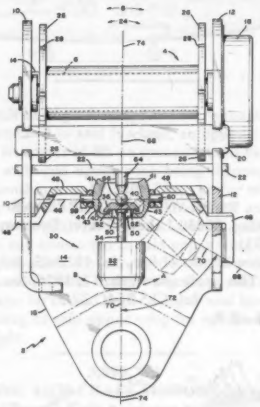
Filed July 10, 1974, Ser. No. 487,427
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.4 A **6 Claims**

1. In a vehicle-sensitive, inertia operated safety belt retractor having a reel for winding a safety belt, means to lock the reel and thereby restrain an occupant of a vehicle during emergency situations, an inertia mechanism, a support assembly mounted on said retractor for supporting the inertia mechanism, and an actuating means responsive to said inertia mechanism for operating the means for locking the reel; the improvement wherein:

said inertia mechanism is a pendulum assembly which includes a pendulum head in contact with said actuating means, said pendulum assembly being actuated by forces exceeding a predetermined magnitude resulting from a sudden change in the motion or orientation of the vehicle, said actuation means operating directly on the means for locking the reel without any intermediate mechanism disposed structurally or operatively between said actuating means and said means for locking the reel; and

said support for said pendulum assembly is a gimbal assembly which includes: a pivot ring which is a concave vessel having a substantially circular support edge upon which said pendulum head is disposed, said pendulum assembly being adapted to pivot upon said support edge in an

infinite variety of lateral directions, said pendulum assembly requiring a force exceeding a predetermined magnitude to lift a part of the pendulum head up and off a part of said support edge before said pendulum assembly will cause said locking means to lock the reel; a swivel axis for said pivot ring adapted to allow said pivot ring to pivot in two lateral directions, a trunnion for supporting said pivot ring; a swivel axis for said trunnion adapted to allow said trunnion to pivot in two lateral directions, said trunnion swivel axis being disposed approximately perpendicular to said pivot ring swivel axis, and a support member for said trunnion, said gimbal assembly thereby being



adapted to pivot in any lateral direction to an infinite variety of operable static positions to which said gimbal assembly is adjustable with reference to said retractor according to the position in which the retractor is oriented by virtue of installation in the vehicle; upon actuation by forces resulting from a sudden change in the motion or orientation of the vehicle said pivot ring and said pendulum assembly having independent action and pivoting in opposite directions; said pendulum assembly and said gimbal assembly having a compact configuration, sufficiently compact for said pendulum assembly and said gimbal assembly to be mounted either within said retractor or outside said retractor.

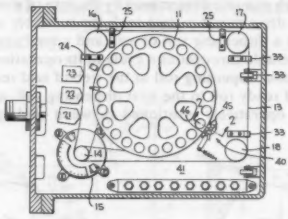
3,995,789

REEL SAFETY BRAKE

Clinton E. Carle, Lanham, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,456
Int. Cl.² G11B *15/22*; B65H *25/04, 25/32*
U.S. Cl. 242—193 **13 Claims**

1. Apparatus for braking a tape transport device including first and second, stacked coaxial reels comprising first and second feelers respectively mounted in proximity to the first and second reels for respectively sensing the tape being fully wound on the first and second reels, brake means mounted in proximity to adjacent hubs of the first and second reels for simultaneously, frictionally engaging both hubs to brake both reels, and a mechanical actuator mechanically coupled to said first and second feelers and said brake means for simultaneously activating the brake means into frictional braking engagement with both hubs in response to either the first or



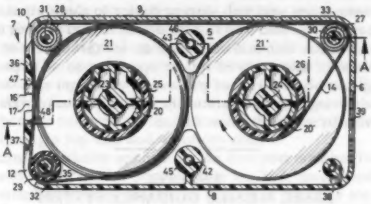
second feelers sensing that the tape is substantially fully wound on either of the reels.

3,995,790

CASSETTE FOR TAPE-SHAPED RECORD CARRIERS

Heinz Kelch, Buchenberg; Hilmar Kirchgessner, and Eduard Schuh, both of Villingen-Schwenningen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed Apr. 22, 1975, Ser. No. 570,457
Claims priority, application Germany, Apr. 24, 1974, 2419686
Int. Cl.² G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—199 **11 Claims**



1. A cassette for tape-shaped record carriers having optically viewable recordings, comprising a housing having a pair of opposite but spaced end walls and a pair of opposite but spaced side walls which connect said end walls and one of which is transparent; a pair of tape hubs rotatably mounted in said housing; a tape convoluted on and extending between said hubs for travel from one to the other thereof; an opening in one of said end walls for access of a recording device to said tape; and guide means in said housing for guiding the traveling tape past said opening in said one end wall substantially parallel to said one end wall so that a recording device may provide recordings on the tape, and thereafter past said transparent side wall substantially parallel to the same so that the recordings on the tape are visible therethrough and will be exposed to view.

3,995,791

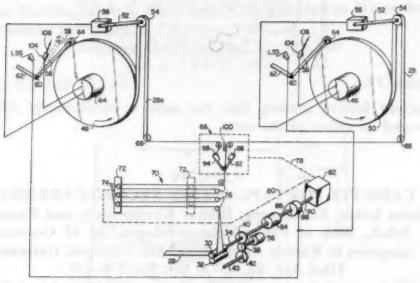
CONTINUOUS WEB SUPPLY SYSTEM

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed July 9, 1975, Ser. No. 594,303
Int. Cl.² B65H *19/18*; B31F *5/00*
U.S. Cl. 242—58.1 **31 Claims**

1. A apparatus for supplying web from successively used rolls thereof to a utilization device without interrupting the feed of web to said utilization device when switching the web supply from one of said rolls to the next, said apparatus comprising: a web utilization device, a drive means having a movable output drive member, means positively drivingly connect-

ing said output drive member to said utilization device to drive said utilization device in synchronism with the movement of said output drive member to cause said utilization device to consume web at a rate determined by the rate of movement of said output drive member, two reels for rotatably supporting respectively a dispensing roll of web and a ready roll of web, a splicer operable throughout a cycle of its operation to splice the web of said dispensing roll to the web of said ready roll to convert said ready roll to the next dispensing roll, a web storage device operatively positioned between said splicer and



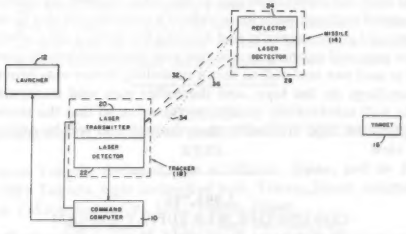
said utilization device, said web storage device being operable in both a pay out mode to decrease the length of web stored therein and in a take up mode to increase the length of web stored therein, and means other than said web positively drivingly connecting said web storage device to said output drive member to drive said web storage device in said pay out mode in synchronism with said utilization device throughout at least one phase of said cycle of splicer operation so as to provide during said phase a rate of pay out of web from said storage device having a fixed relationship with said rate of web consumption by said utilization device.

3,995,792

LASER MISSILE GUIDANCE SYSTEM

William F. Otto; William B. McKnight, and James J. Fagan, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1974, Ser. No. 514,697
Int. Cl.² F41G 7/14, 7/18, 9/00
U.S. Cl. 244—3.14 **3 Claims**



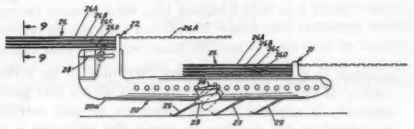
1. A method for directing a missile to a predetermined target comprising launching a missile at a predetermined roll rate and in a predetermined trajectory from a launcher to a target so that the missile is rotating when launched at a predetermined roll rate; tracking the missile with a missile tracker by the steps of pulse code modulating a radiant energy beam, directing the modulated beam toward the missile in flight, intercepting the beam at the missile, reflecting the intercepted beam back toward the directed beam, amplitude modulating the reflected beam by subjecting the beam to polarization at a location substantially at the surface utilized for beam reflection, detecting the amplitude modulated reflected beam at the missile tracker and producing signals from the beam detected at the missile tracker; processing the signals to determine the relationship of the missile to the predetermined trajectory and producing error corrections from the processed signals in the form of a new trajectory from the missile to the target; transmitting the error corrections from the missile tracker toward the missile and detecting the transmitted error corrections at the missile; and utilizing the detected error corrections on the missile for directing the missile into the new trajectory.

3,995,793

ROTO-WING JET AIRPLANE

Russell T. Wing, 20050 Lakeview Ave., Deephaven, Excelsior, Minn. 55331

Continuation-in-part of Ser. No. 491,645, July 25, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,488
Int. Cl.² B64C 27/22
U.S. Cl. 244—7 R **19 Claims**



1. An aircraft having body structure capable of generally horizontal flight and capable of vertical flight while said body structure is in a generally horizontal position;

first means for propelling said body structure in generally horizontal flight; and

second means for propelling said body structure in generally vertical flight;

wherein said second means includes a rotor system; said rotor system including;

slip plate means,

rotor blade means,

means for moving said slip plate means, and

means operatively interconnecting said slip plate means and said rotor blade means whereby the pitch of said blade means is changed in response to movement of said slip means in a predetermined manner;

wherein said slip plate means has a central opening bounded by a surface having a concave curvature;

internally threaded first slip plate support sleeve means for supporting said slip plate means, said sleeve means including a convex surface in engagement with said concave surface of said slip plate means;

said slip plate means and said slip plate support sleeve means being movable relative to each other about said contacting concave and convex surfaces;

an externally threaded supporting member mounted in said internally threaded first slip plate support sleeve means;

wherein said means for moving said slip plate means includes means for turning said externally threaded supporting member; and

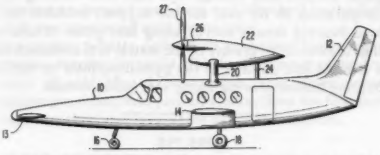
the movement of said externally threaded supporting member causing said slip plate support means to move longitudinally with respect to the externally threaded supporting member.

3,995,794

SUPER-SHORT TAKE OFF AND LANDING APPARATUS

Edward M. Lanier, 900 Newportville Rd., Croydon, Pa. 19020

Filed June 24, 1975, Ser. No. 589,746
Int. Cl.² B64C 15/12
U.S. Cl. 244—12 A 11 Claims



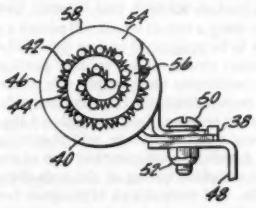
1. An aircraft having a fuselage and empennage with a fixed lower wing attached to said fuselage, an upper wing pivotally connected at its center of lift on spaced means carried by said fuselage and with said upper wing being disposed in spaced parallel relationship to said lower wing, power means carried by said upper wing for propelling said aircraft, and adjustable means carried by said fuselage in spaced relation to said spaced means and connected to said upper wing to unload lift and drag aerodynamically through a small minus and plus degrees movement of said upper wing about said center of lift to transfer major lift of said upper wing to said lower wing and reduce total drag of said upper wing for optimum cruise and high speed flight.

3,995,795

WIRING ANTI-CHAFE SUPPORT DEVICE

John Hogan, Cypress, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 24, 1975, Ser. No. 561,481
Int. Cl.² F16L 3/12
U.S. Cl. 248—68 R 6 Claims



1. A clamp means and anti-chafe support device combination comprising:

clamp means including at least generally opposing loop portions; and

an anti-chafe support device including a strip of resilient material of predetermined length, a plurality of raised nodes on a first side of said strip, and predetermined structure on a second side of said strip to accommodate said at least generally opposing loop portions of said clamp means, said strip having rodlike elements laid between said nodes and spaced along said length of said strip, and said strip being rolled in a generally spiral configuration which is clamped by said at least generally opposing loop portions of said clamp means,

said nodes being of a gearlike configuration extending transversely to said length of said strip and said rodlike elements being normally positioned longitudinally parallel to said gearlike teeth nodes, and

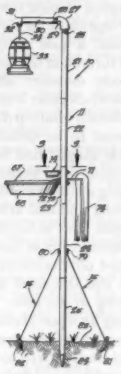
said structure on said second strip side comprising longitudinal side walls defining a channel of sufficient width to accommodate said at least generally opposing loop portions of said clamp means.

3,995,796

LANTERN HOLDER AND WASH PAN STAND DEVICE

George William Kline, 6 Evans Road, Chillicothe, Ohio 45601

Filed May 12, 1975, Ser. No. 576,683
Int. Cl.² A45F 3/44
U.S. Cl. 248—121 1 Claim



1. A portable stand device comprising, in combination:

a post member consisting of a first top most elongated cylindrical member having a top end and a bottom end, a second elongated cylindrical member having a top end and a bottom end, a third cylindrical member forming the mid-section of the post and having a top end and a bottom end, a fourth cylindrical member having a top end and a bottom end, and a fifth bottom most cylindrical member having a top end and a bottom end;

means detachable connecting the first post member bottom end to the second post member top end, the second post member bottom end to the third post member top end, the third post member bottom end to the fourth post member top end, and the fourth post member bottom end to the fifth post member top end, the means detachably mounting the adjacent ends of the post members to each other comprising a cylindrical socket formed in one of the member ends with a mating elongated cylindrical pin formed on the other of the member ends, the pin adapted to engage in the socket to detachably secure the adjacent-most post members together;

the first post top most member top end defining the top end of the post;

the fifth bottom most member bottom end being of an inverted conical shape defining a pointed bottom post end adapted to be stabbed into the ground supporting surface to secure the post in an upright position at the desired point of useage;

a pair of diametrically opposed outwardly projecting boss members affixed to the sides of the fourth cylindrical member;

a pair of stakes adapted to be driven into the ground at diametrically opposed sides of the post;

a pair of independent flexible cords each adapted to have one end tied to one of the boss members with their opposite ends adapted to be wrapped about projecting ends of the stakes to provide additional support to the post in the upright position;

an extension member having one end detachably affixed to the post top end with the free end thereof extending outwardly therefrom at a direction normal to the axis of the post and terminating a short distance outwardly therefrom;

a hook defining member affixed to the projecting free end

of the extension member and adapted to hold a lantern suspended therefrom;

a series of three axially aligned openings spaced longitudinally apart from each other and extending diametrically through the third mid-section post member;

a wash pan supporting ring comprising a first body member of a general sickle shape having a semi-circular portion terminating at one end in a radially outwardly projecting threaded shaft adapted to pass freely through one of the third post member openings for detachably mounting the member to the post, a pair of circumferally disposed cylindrical sockets formed in the ends of the semi-circular portion of the body member and opening outwardly therefrom, and a semi-circular body member having pins extending circumferally outwardly from the opposite ends thereof adapted to be detachably received in the sockets of the sickle shaped first body member for forming therewith a circular ring shape;

a towel ring comprising a solid ring shaped body member, a threaded shaft having one end affixed to the body member with its opposite end extending radially outwardly therefrom and adapted to pass freely through one of the openings in the third post member, and a nut adapted to be threaded onto the threaded member to detachably secure the towel ring to the post;

a soap dish comprising an open skeleton frame type rectangular box-like configuration open at the top surface thereof, a threaded shaft affixed to one side of the rectangular box and extending outwardly therefrom in a direction normal thereto and adapted to pass freely through one of the openings in the third post member, and a nut adapted to be threaded onto the shaft to detachably mount the soap dish to the post; and

an expandable carrying case formed of flexible material and including a lid and a handle and being of a size to carry all of the components of the portable stand in their collapsed positions between a storage location and a location of intended useage.

3,995,797

TILT MOUNTING HEADS

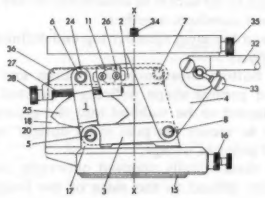
Stanley Hubert Knight, Thetford, England, assignor to W. Vinten Limited, Bury St. Edmunds, England

Filed Dec. 2, 1974, Ser. No. 528,899

Claims priority, application United Kingdom, Dec. 10, 1973, 57134/73

Int. Cl.² F16M *11/12*

U.S. Cl. 248—184 **11 Claims**



1. A tiltable mounting for moving an article such that the movement of the center of gravity of the article defines a straight line, said mounting comprising:

a mounting frame;

a tiltable support member to which the article may be secured;

pantographic linkage pivotally mounted to said mounting frame, said linkage including at least a first link that is substantially vertical with respect to said mounting frame when said pantographic linkage forms substantially a rectangle, said tiltable support member fixedly mountable to said first link such that said support member can be secured in a fixed manner to said first link, and at least a second link that is substantially horizontal relative to said mounting frame when said pantographic linkage forms substantially a rectangle;

a load bearing means located on said second link for supporting said second link; and

a guide means, located on said mounting frame, said load bearing means in engagement with said guide means, said guide means, said linkage and said load bearing means cooperating to tilt said tiltable support member as said load bearing means moves along said guide means such that the center of gravity of the article is maintained along a straight line parallel to the path described by said load bearing means moving along said guide means.

3,995,798

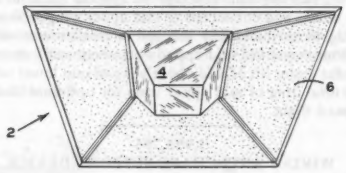
SUPPORT FOR A VAULTED CEILING MODULE

Harold W. Nikolaus, Columbia, and Ernest B. Nute, Jr., Mountville, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 5, 1975, Ser. No. 637,900

Int. Cl.² F21R *3/02*

U.S. Cl. 248—214 **2 Claims**



1. A support structure for supporting ceiling elements within a suspended ceiling system, the suspended ceiling system having main runner structures which are generally of an inverted "T" shape with an upwardly extending vertical web, said support structure having a body portion, at the lower end thereof, there being a cutout which will permit a portion of the body portiion to be positioned on one side of the vertical web of a main runner structure and another portion of the body portion to be positioned on the other side of the vertical web of the main runner structure, at least one side of the body portion which is positioned on one side of the main runner structure having a plate structure, said plate structure extending generally parallel with the vertical web of the main runner and said plate structure having on the ends thereof a plurality of vertical tabs, said vertical web of the main runner structure having a plurality of vertical apertures positioned therein and only one of the tabs of the plate structure of the support structure being positioned in one of the apertures of the vertical web at least one tab engaging the vertical web side, the upper end of the body portion having means to fasten the support structure to support bars which in turn will be positioned above and parallel to the plane of the main runner structures.

3,995,799

HANG GLIDER

Frank J. Bartolini, 4 Patton Court, Wayne, N.J. 07470

Filed May 23, 1975, Ser. No. 580,440

Int. Cl.² B64C *31/02*

U.S. Cl. 244—16 **11 Claims**

1. A bi-winged collapsible hang glider assembly comprising:

a variable camber upper swept wing made of sail fabric;

an aerodynamically formed wing tip at each outer edge of said upper wing;

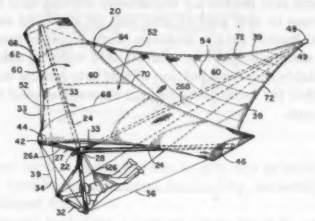
frame members including a longitudinal forward tubular keel member supporting the leading apex of said upper wing;

two transverse tubular support members having hinged connections to said aerodynamically formed wing tips of said upper wing and having pivotal connections to said forward keel member;

a lower undercambered sail wing defined by said transverse tubular support members;

a rearward longitudinal tubular after keel member having pivotal connections with said forward keel member and transverse support members and attached to the forward and rear apexes of said lower wing;

a connecting tubular collar with perimeter hinge mounting means, surrounding said after keel member at the leading apex of said after keel member, said hinge mounting means providing said pivotal connections for said forward keel member and transverse support members;



a control bar mounted to the underside of said tubular collar;

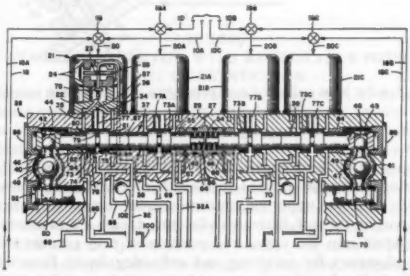
a system reinforcing stranded cables attached to the lower corners of said control bar said cables extending to the leading apex of said forward keel member, including a turnbuckle, said cables extending to the rear apex of said after keel member, and said cables extending to said hinged connections of said transverse support member and said formed wing tips, said cables defining the leading and trailing edges of said upper wing and the trailing edge of said lower and said cables extending from said leading apex of said forward keel member to said formed wing tips.

3,995,800

FLUID CONTROL SYSTEM

Emery C. Swogger, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.

Division of Ser. No. 391,173, Aug. 24, 1973, Pat. No. 3,915,427. This application June 18, 1975, Ser. No. 588,127
Int. Cl.² B64C *13/42*
U.S. Cl. 244—78 **7 Claims**



1. An aircraft servo control system responsive to a plurality of redundant electrical command signals and operative to position a movable airfoil, the control system comprising:

a plurality of electro hydraulic transducer each responsive to a respective one of the electrical command signals and each operative to produce a differential pressure fluid output signal corresponding to the respective electrical command signal;

means summing the outputs of the electro hydraulic transducers by means of a movable piston structure having a respective pair of piston faces corresponding to each pair of transducer outlets whereby the position of the piston structure corresponds to the net electrical command signal applied to the transducers;

means monitoring the differential pressure across the fluid outlets of each transducer and shutting off any transducer upon the differential pressure across its outlets exceeding a predetermined amount;

fluid powered actuator means operable to translate the airfoil and having a movable piston structure operatively connected to the airfoil;

force amplifying means comprising a flow control valve having a valve element to which the movable piston structure is operatively connected, the flow control valve having fluid outlets connected to drive the actuator; the force amplifying means and the summing means comprising a means controlling the velocity of movement of the actuator piston structure; and

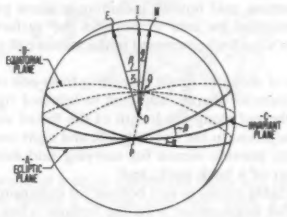
position feedback means connected between the actuator and the respective transducer for generating a position correction signal for each transducer.

3,995,801

METHOD OF STORING SPARE SATELLITES IN ORBIT

Donald Spencer Bond, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,242
Int. Cl.² B64G *1/00*
U.S. Cl. 244—158 **2 Claims**



1. A method of operating a satellite system including at least one operating satellite in geo-stationary orbit, and at least one spare satellite, said spare satellite being stored in orbit for subsequent use on command and having means responsive to suitable commands for altering its orbit by thrust propulsion means which include north-south station-keeping means, comprising the steps of:

a. launching a spare satellite into an inclined progressively changing orbit at a substantially synchronous altitude such that Ω is selected to minimize the maximum inclination of the orbit throughout a predetermined time period defining the storage life of the satellite, wherein Ω is the right ascension of the ascending node,

b. selecting the inclination of said spare satellite to be initially 7°20′ or less in accordance with said predetermined time period,

c. selecting the right ascension of the ascending node Ω to be between 180° and 360° whereby, during said predetermined time period, the orbit inclination remains bounded without ever operating said north-south station-keeping means while stored in orbit prior to said subsequent use on command,

d. testing periodically the operability of said spare satellite but otherwise maintaining a nonoperating condition of said spare satellite in said orbit, and

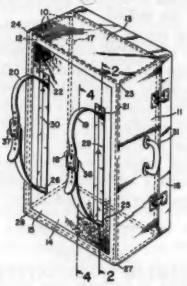
e. in the event said operating satellite fails to operate, altering on command by the use of said thrust propulsion means the orbit inclination of said spare satellite to substantially zero whereby said spare satellite is moved from its stored orbit to a geo-stationary orbit for operational use in said geo-stationary orbit.

3,995,802

BACK PACK SUITCASE

Brian Johnston, 1225 15th St., Santa Monica, Calif. 90404

Filed Nov. 10, 1975, Ser. No. 630,533
Int. Cl.² A45F 3/04
U.S. Cl. 224—8 R 5 Claims



1. A back pack suitcase comprising, in combination:

a. parallelepiped shaped enclosure defining a suitcase, one broad side of the suitcase constituting a top lid providing access thereto and the opposite broad side constituting the bottom, said bottom including resilient padding over a portion of its area to cushion the surface against a person's back when carried in the manner of a back pack; and,

b. a pair of shoulder straps extending from one of said broad sides exterior thereto adjacent to left and right end corners thereof along the length of the broad side to terminate adjacent to the opposite left and right end corners to thereby provide means for carrying said suitcase in the manner of a back pack; and

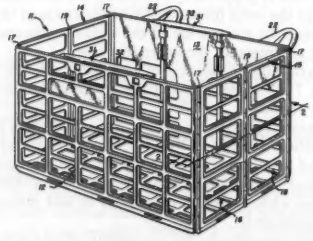
c. retractable means in said bottom for collapsing said straps into flat engagement with the bottom when not in use, said suitcase including a handle so that it may be carried in one hand in a conventional manner.

3,995,803

FOLDABLE BICYCLE BASKET

Mark D. Uitz, 1050 Crest View, Mountain View, Calif. 94040

Filed Sept. 3, 1974, Ser. No. 502,852
Int. Cl.² B62J 7/00
U.S. Cl. 224—33 A 4 Claims



1. In a foldable bicycle basket:

basket means comprising rigid side and bottom wall portions hinged together for opening for toting objects and for folding and compact stowage;

means for attaching said basket means to a bicycle;

tote handle means affixed to said basket means for toting same in the open condition for toting objects in said basket;

means for retractably affixing said tote handle means to said basket means so that said tote handle means can be retracted for folding and compact stowage of said foldable basket means;

wherein said side walls include fore and aft side walls interconnected by centrally hinged and foldable mutually opposed end side walls, and wherein said pair of handle means are retractably affixed by said affixing means to said fore and aft side walls; and

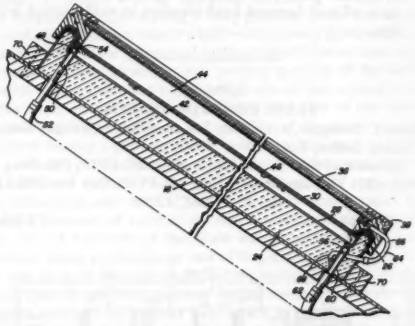
wherein said means for retractably affixing said tote handle means to said pair of fore and aft opposed side walls of said basket means includes, slide receiver means affixed to said opposed fore and aft side walls of said basket to slidably receive a portion of said tote handle means therewithin for retracted compact stowage of said tote handle means.

3,995,804

INVERTED OPEN CHANNEL SOLAR HEAT COLLECTOR PANEL

Carlos D. Folds, Winston-Salem, and Daniel A. Gilbert, Pfafftown, both of N.C., assignors to Larry J. Folds, Winston-Salem, N.C., a part interest

Filed Aug. 15, 1975, Ser. No. 606,407
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 9 Claims



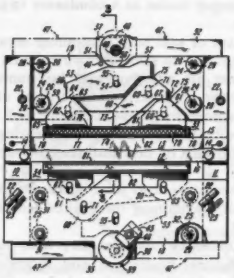
1. A solar heat collector comprising an open top heat insulative housing, an inclined heat absorptive and conductive panel secured across said housing above the bottom thereof and at least substantially sealing that portion of the interior of said housing below said panel, said panel including downwardly opening underside grooves formed therein extending downwardly from the upper end portion thereof toward the lower end portion thereof, first means for introducing a heat absorptive liquid into the upper end portions of said grooves and second means for receiving and collecting liquid from the lower ends of said grooves, said grooves being of a cross sectional shape and size to allow at least substantially all of the liquid introduced into the upper ends of said grooves to be retained therein by the cohesive and surface tension properties of the liquid during its movement downwardly through said grooves by gravity to the lower end portion of said panel.

3,995,805

BRAZE FIXTURE

Harry C. Gersbacher, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Sept. 18, 1974, Ser. No. 507,154
Int. Cl.² B23K 37/04; B25B 1/08
U.S. Cl. 228—44.1 R 7 Claims



1. A fixture used in multiple form to grip and to hold superposed plate type heat exchangers for brazing, including

a. an H-shaped frame,

b. plate means including a pair of plates fixed to opposite faces of laterally spaced uprights of said frame both above and below the cross member thereof and in spaced relation thereto,

c. said cross member having upper and lower edges defining opposed seating surfaces,

d. said seating surfaces cooperating with confronting edges of respective pairs of plates to form slots above and below said cross member accommodating the insertion therein of respective heat exchangers,

e. means on and relatively movable to each pair of plates to make multiple contact with a respective inserted heat exchanger, said relatively movable means comprising an arrangement of pressure applying members slidably and tiltably mounted between each pair of plates in a plane common to one another and to laterally spaced uprights of said frame,

f. and other means associated with each pair of plates and reacting thereon adjustable to effect a pressural engagement of the relatively movable means with a respective heat exchanger, urging it to a seat on a respective seating surface, said other means associated with each pair of plates and reacting thereon being received between a respective pair of plates and positioning in and being adjustable in said common plane.

3,995,806

STACKABLE CARTON WITH RECLOSABLE POUR SPOUT CONSTRUCTION

Thomas McSherry, 404 Terrace Road, Bayport, N.Y. 11705

Filed July 11, 1975, Ser. No. 596,026
Int. Cl.² B65D 5/72
U.S. Cl. 229—17 R 7 Claims

1. A stackable pour spout container comprising flat top and bottom portions and wall means extending therebetween for retaining pourable contents therewithin, a pour spout integral with said wall means and occupying a triangluar area, the base of which area is adjacent said top portion, the sides of which area are equal and extend to the apex of the area, which apex is spaced a distance from said bottom portion, said pour spout consisting of a pair of flexible triangular pour spout elements having apices substantially in common with the apex of the triangular area, said elements being joined along a central line hinge lying in a plane bisecting the triangular area through the apex thereof and having sides joined to said wall means along line hinges which are co-extensive with and extend along planes common with the sides of the triangular area, the base edges of said triangular elements being free and of a cumulative length longer than the base of said triangular area, said spout being movable between a closed position in which the

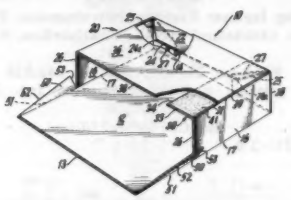
base edges of said flexible triangular pour spout elements converge inwardly of said wall means and an open position in which the base edges of said flexible triangular pour spout elements converge outwardly of said wall means, and means integral with said flexible pour spout elements for pulling the same from the closed to the open position.

3,995,807

DISPOSABLE PAN INTO WHICH PET WASTE CAN BE SHOVELED ON THE STREET

Sal Dell'Anno, 165-16 65th Ave., Flushing, N.Y. 11365

Filed Aug. 29, 1975, Ser. No. 608,887
Int. Cl.² B65D 5/08
U.S. Cl. 229—38 10 Claims



1. A pan made of a single cardboard blank and comprising a box portion having a bottom wall, side walls, a rear wall and a top wall and being open at the front, and said bottom wall having a portion extending forwardly of the side walls and top wall of said box portion and in the plane of the bottom wall, said bottom wall including said forwardly extending portion comprising a single unfolded rectangular section, and side flaps extending from the sides of the forwardly extending portion of the bottom wall, and being swingable to inclined upwardly and outwardly extending position while said forwardly extending portion is in the plane of said bottom wall said side flaps being attached only to said forwardly extending portion said forwardly extending portion having a length in said forwardly extending direction, greater than the height of said side walls.

3,995,808

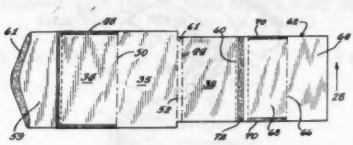
UNIT CONTAINING VARIABLE MESSAGES

James W. Kehoe, Shelby, Ohio, assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 515,428, Oct. 16, 1974, abandoned.
This application Jan. 14, 1976, Ser. No. 648,925
Int. Cl.² B65D 27/06, 27/34
U.S. Cl. 229—73 10 Claims

1. An envelope unit made from an integral folded single sheet, said folded sheet being preformed and severed from a continuous web, said sheet having a first reactive coating on one side thereof and a second reactive coating on the other

side thereof, whereby, when said first and second reactive coatings are brought together and pressed together, a localized, visible mark is formed in one of said coatings, said integral folded single sheet comprising first and second envelope-defining panels folded and peripherally sealed together and integrally connected by a fold line, a third message panel disposed between said envelope-defining panels and connected thereto by a second fold line, the edge of said message panel opposite to said second fold line being unattached to



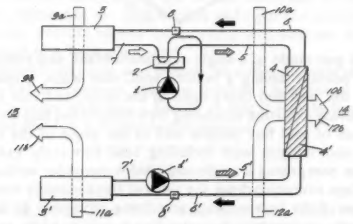
said envelope-defining panels, said first and second fold lines and said message panel edge opposite said second fold line being parallel to the longitudinal axis of said web from which said sheets are severed, whereby the reactive coatings are so positioned that typing or otherwise impressing printing upon the exterior of one of said envelope-defining panels causes corresponding printing to be formed on said message panel and a return envelope portion comprising a pair of joined panels sealed together and connected by a fold line to one of said envelope-defining panels.

3,995,809

ARRANGEMENT FOR AIR-CONDITIONING OF ONE OR MORE ROOMS

Tord Herlog Ingemar Karlsson, Norrahammar, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 21, 1975, Ser. No. 542,828
Claims priority, application Sweden, Jan. 21, 1974, 7400767
Int. Cl.² G05D 23/01
U.S. Cl. 237—2 B **7 Claims**



1. A heat pump system for heating a room having room-air exhaust means for delivering substantially only exhaust air from said room to the outside atmosphere, comprising:

base heat-pump means, comprising first heat exchanger means in heat-exchange relation with exhaust air in said room-air exhaust means, second heat exchanger means in heat-exchanger relation with air supplied to said room, first means for circulating a fluid medium between said first and second heat exchanger means, and first compressor means cooperating with said first circulating means and acting on said fluid medium for operating said first heat exchaner means as an evaporator to absorb heat from said exhaust air and for operating said second heat exchanger means as a condenser to deliver heat to said room;

auxiliary heat-pump means, comprising third heat exchanger means in heat-exchange relation with said outside atmosphere, fourth heat exchanger means in heat-exchange relation with said air supplied to said room, second means for circulating a fluid medium between said third and fourth heat exchanger means, and second compressor means cooperating with said second circulating means and acting on said fluid medium for operating said third heat exchanger means as an evaporator to absorb heat from said atmosphere and for operating said fourth heat exchanger means as a condenser to deliver heat to said room;

said evaporator of said base heat-pump means being positioned in relation to said room-air exhaust means so that said exhaust air adjacent said last-named evaporator remains above the freezing temperature of water in said air, even when the temperature of said outside atmosphere is substantially below said freezing temperature, whereby frosting of said last-named evaporator is prevented;

means for operating said base heat-pump means as demanded for maintaining the desired temperature of said room; and

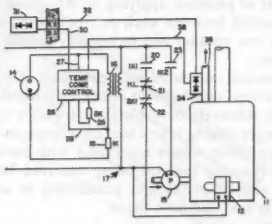
means for operating said auxiliary heat-pump means to effect additional heating of said room only when the temperature of said atmosphere becomes so low that said base heat-pump means is not able by itself to maintain said desired temperature.

3,995,810

TEMPERATURE COMPENSATION CONTROL

James R. Banks, R.F.D. 2 Box 113, Dover, N.H. 03820

Filed Oct. 3, 1975, Ser. No. 619,234
Int. Cl.² F24D 3/00
U.S. Cl. 237—8 R **11 Claims**



1. A method of temperature control for varying the temperature of a heat transfer medium in a temperature conditioning system inversely with the temperature of the thermal reservoir producing the undesired heat exchange comprising:

a. sensing the voltage drop of at least one forward biased semiconductor pn junction thermally coupled to the thermal reservoir;

b. sensing the voltage drop of at least one forward biased semiconductor pn junction thermally coupled to the heat transfer medium at least one point in its circulation path from and to the temperature conditioning source of said system;

b. combining the sensed voltage drops of all said pn junctions to derive a control voltage varying directly with the sum of said voltage drops;

d. comparing a reference voltage with said control voltage; and

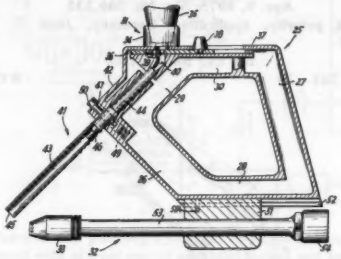
e. changing the operation of said temperature conditioning source as the difference between said reference voltage and said control voltage changes polarity.

3,995,811

NOZZLE FOR DEPOSITING METAL POWDER BY SPRAYING

John P. Broderick, New Hyde Park, and John E. Lyons, Brooklyn, both of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Filed May 22, 1975, Ser. No. 579,847
Int. Cl.² B05B 7/20
U.S. Cl. 239—85 5 Claims



1. A powder flame spray torch and nozzle assembly comprising a housing means for externally feeding powder by gravity through a conduit extending to a flame issuing from a nozzle coupled to means on said housing through which a combustible gas is fed to and through said nozzle, said nozzle comprising,

a hollow cylindrical body defining a gas chamber and having a converging conically shaped nose terminating into a closed tip,

and a plurality of gas-conducting orifices communicating with the gas chamber of said nozzle and passing through the nose of said nozzle substantially coaxial with the axis of said nozzle and emerging from the conical surface thereof short of the tip,

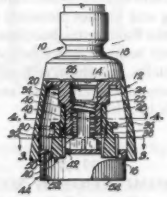
said orifices being disposed radially about the axis of said nozzle and lying in a circle on said conical surface adjacent the tip when observed from the tip end of said nozzle.

3,995,812

ADJUSTMENT ASSEMBLY FOR SHOWER HEADS

Robert V. Anderson, Fort Worth, Tex., assignor to Producers Specialty & Mfg. Co., Inc., Fort Worth, Tex.

Filed Aug. 13, 1975, Ser. No. 604,464
Int. Cl.² B05B 1/14
U.S. Cl. 239—458 13 Claims



1. An adjustable spray head comprising:

a tubular housing having a liquid inlet at one end and a liquid outlet at the opposite end;

a plurality of spray pattern control elements each having at least one peripherally disposed, longitudinally tapering, liquid flow groove therein;

structure circularly mounting said elements within said housing for rotation as a unit about a common axis extending between said inlet and said outlet with said grooves extending longitudinally of said axis;

a faceplate having a plurality of circularly spaced openings therein for said elements;

a tubular arbor concentrically disposed within said housing and having an open outermost extemity,

said arbor being internally threaded adjacent said extremity and for a distance inwardly therefrom; and

a shank projecting normally from said faceplate in concentric relationship to the circle of openings therein,

said shank being externally threaded and matingly received within said arbor,

said structure including a ring surrounding said arbor and means mounting said ring on the exterior of the arbor adjacent said extremity for rotation relative to the latter,

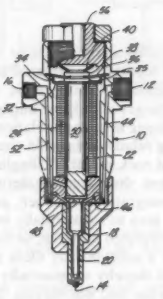
said ring carrying said elements in registration with said openings for projection through the latter a variable amount in response to threading the shank into or out of said arbor.

3,995,813

PIEZOELECTRIC FUEL INJECTOR VALVE

Hans U. Bart, 3820 Duck Lake Road, Whitehall, Mich. 16852, and Robert Chick, 16852 Harkness Circle, Huntington Beach, Calif. 92649

Filed Sept. 27, 1974, Ser. No. 509,931
Int. Cl.² B05B 1/30
U.S. Cl. 239—584 10 Claims



10. A liquid fuel injector valve for an internal combustion engine, said valve comprising:

a. a generally cylindrical valve body adapted to contain liquid fuel therein under pressure, said valve body having a liquid fuel inlet port and a liquid fuel outlet port;

b. a valve needle movable axially between a first position where said needle closes said outlet port and a second position where said outlet port is open;

c. a piezoelectric element in the form of a stack of coaxial piezoelectric discs cooperative with said needle for effecting movement of said needle to said second position in response to an electrical potential imposed across said element;

d. an axially extending extending passageway through said stack;

e. a piston positioned within said passageway and attached to said stack for axial movement therewith;

f. a liquid chamber positioned axially between said piston and said needle wherein movement of said piston in a direction away from said outlet port effects a reduction in liquid pressure within said chamber thereby creating a differential pressure across said needle in a manner to effect said movement of said needle to said second position; and

g. a vaulted spring washer cooperative with said element and said piston such that movement of said element in response to said potential effects the application of a force against said washer in a manner to effect the vault-

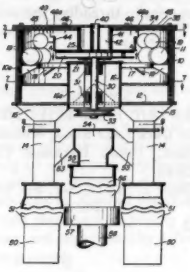
ing of said washer in the direction of movement of said element and such that, upon removal of said potential, a reverse vaulting of said washer is effected biasing said valve needle toward its closed position.

3,995,814

IMPACT DISINTEGRATOR

Albert K. Alberts, 1084 Canyon Crest Drive, Bountiful, Utah 84010

Filed Aug. 25, 1975, Ser. No. 607,358
Int. Cl.² B02C 23/00
U.S. Cl. 241—5 12 Claims



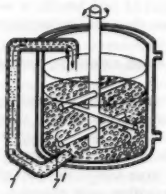
11. A method of disintegrating ore or rock materials, comprising the steps of feeding the material to be disintegrated to a rotary slinger within a disintegration chamber containing closely associated target chunks of impact breaking material surrounding the slinger in spaced relationship therewith, said target chunks being relatively large in size as compared to the size of said ore and rock material; slinging the material to be disintegrated against the target material surrounding said slinger in the disintegration chamber; passing a flow of air through the target area to substantially immediately clear the target area of disintegrated material, so that the particles to be disintegrated have a substantially clear path from slinger to impact surface and thereby substantially avoid collision with disintegrated particles; and discharging the disintegrated material from the disintegration chamber.

3,995,815

PRODUCTION OF FLAKED METALLIC POWDERS

Michael Megelas, Clinton, N.J., assignor to International Bronze Powders Ltd., Montreal, Canada

Filed Oct. 25, 1974, Ser. No. 518,059
Int. Cl.² B02C 23/36
U.S. Cl. 241—15 19 Claims



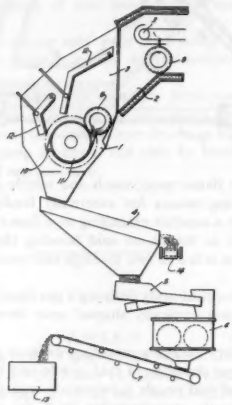
1. A method of making flaked metal powders wherein a heterogeneous liquid system comprising a inert liquid and a lubricant and including a finely divided metal, is subjected to attrition in an enclosure in which there are a plurality of attritive elements, an agitator being moved through the elements to displace those in its path, wherein the ratio of attritive elements to finely divided metal is between 37 to 1 and 10 to 1 by weight.

3,995,816

METHOD OF AND APPARATUS FOR FRAGMENTING AUTOMOBILE TIRES AND ANALOGOUS ARTICLES

Herbert Motek, Altenberge, Germany, assignor to Hazemag Dr. E. Andreas KG, Munster, Germany

Division of Ser. No. 476,705, June 5, 1974. This application Apr. 9, 1975, Ser. No. 566,335
Claims priority, application Germany, June 7, 1973, 2329017
Int. Cl.² B02C 21/00
U.S. Cl. 241—23 9 Claims



1. A method of fragmenting automobile tires and analogous articles of rubber or synthetic plastic material so as to separate their material from embedded reinforcements of textile or other substances, by freezing the articles to make their material brittle and exposing them to hitting forces, comprising the steps of feeding the frozen articles into an impactor having a rotor which turns about a horizontal axis and is provided with smooth striking elements which hit the incoming particles and fling them in circumferential direction of said rotor freely against smooth impact elements arranged above the rotor, so that thereupon they fall back upon said rotor to be repeatedly hit by the striking element and freely flung against the impact elements, whereby the articles are subjected to pure hitting and impact forces from different directions upon contact with the smooth striking and impact elements so that the material is fragmented and the fragments dissociate from the reinforcements and the latter remain intact; screening the fragments into which the articles are shattered, so as to separate the liberated reinforcements therefrom; and particulizing the screened fragments in a hammermill.

3,995,817

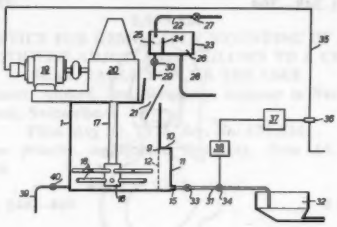
COMMINUTION OF SOLIDS

Ronald Eric Brociner, St. Austell, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

Filed Sept. 17, 1975, Ser. No. 614,249
Claims priority, application United Kingdom, Sept. 17, 1974, 40551/74
Int. Cl.² B02C 23/36
U.S. Cl. 241—30 21 Claims

1. An apparatus for use in comminuting particulate solids which apparatus comprises (a) an attrition-grinding mill including a grinding chamber provided with an internal, rotat-

able impeller for agitating the contents of the grinding chamber, inlet means enabling a feed slurry of a particulate solid to be comminuted to be introduced into the grinding chamber, an outlet means including a sieve for allowing therethrough ground product slurry whilst retaining the granular grinding medium within the grinding chamber, the sieve being disposed at a position such that, when the apparatus is in use, the sieve is below the surface of a mixture of granular grinding medium



and slurry in the grinding chamber, (b) first control means associated with at least one of said inlet means and said outlet means of the attrition-grinding mill for controlling the relative volume flow rates of said feed slurry and said ground product slurry, and (c) second control means associated with the outlet means of said attrition-grinding mill and responsive to changes in the volume ratio of granular grinding medium to slurry in the grinding chamber for stopping or starting the flow of ground product slurry through said outlet means.

3,995,818

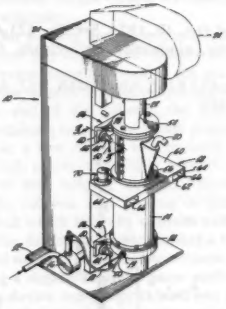
REMOVABLE SANDMILL VESSEL

Samuel Arthur Skeen, Jr., Claremont, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 573,549, May 1, 1975, abandoned. This application July 16, 1975, Ser. No. 596,438

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46.11 **22 Claims**



1. Industrial apparatus for processing liquids comprising:

a support structure;

a vertically oriented vessel positioned to the side of said structure for receiving sand or other such grinding media and liquid to be processed within said vessel;

a rotor in said vessel for agitating the grinding media and the liquid;

a rotor drive shaft extending vertically out one end of the vessel and a driven member attached to the shaft exterior of the vessel;

a motor mounted on said support;

transmission means driven by said motor and connected to said driven member to rotate said rotor shaft;

means for enabling said transmission means to be quickly disconnected from said driven member so that the rotor shaft and the driven member may be separated from the support as a unit with the vessel;

means attached to said vessel for receiving the tines of a forklift truck so that said unit may be readily moved to or from said support; and

cooperating mounting means extending from the side of said vessel and from said support for quickly mounting said vessel on said support including means for guiding the vessel into mounted position which enables the operator of said forklift truck to position single-handedly the vessel on the support.

3,995,819

APPARATUS FOR RECLAIMING AND RECYCLING THERMOSETTING SCRAP

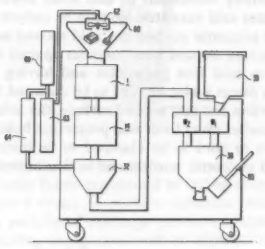
Mahito Kunogi, Nagoya, and Yosuke Oyama, Obu, both of Japan, assignors to Kabushiki Kaisha Meiki Seisakusho, Japan

Filed Nov. 12, 1975, Ser. No. 631,402

Claims priority, application Japan, Nov. 15, 1974, 49-132332

Int. Cl.² B02C *23/34*

U.S. Cl. 241—58 **2 Claims**



1. An improved apparatus for reclaiming and recycling thermosetting scrap, which integrally and compactly comprises:

grinding means to provide ground scrap, said grinding means having first rotatable hammers and a perforated screen provided underneath the rotatable hammers;

an atomizer to provide powdered scrap, said atomizer having second rotatable hammers smaller than said first rotatable hammers for pulverizing said ground scrap further into finer powders and a corrugated liner confronting said hammers;

a conveyor means for conveying said ground scrap to said atomizer at a controllable rate;

a pair of measuring means having a pair of buckets provided with a pair of shutters simultaneously openable by balancing of weights which are controllable at a desired ratio therebetween;

means to feed said powdered scrap from said atomizer to one of said measuring means and means to feed virgin material to the other of said measuring means; and

a purifying means comprising a heating chamber and a reaction chamber containing catalizer to purify gas generated from said grinding and pulverizing process.

3,995,820

ADJUSTABLE CLAMPING MEMBER

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

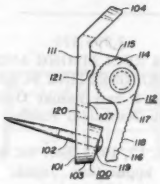
Division of Ser. No. 489,051, July 16, 1974, Pat. No. 3,911,516. This application July 23, 1975, Ser. No. 598,540

Int. Cl.² F16G *11/00;* **F44B** *21/00*

U.S. Cl. 248—216 **19 Claims**

1. A push pin clamp for a wire or cord comprising a base

member having a flat surface, a pin having one end completely embedded in and rigidly held by said base member, said pin having a sharpened end extending from said flat surface at an acute angle to a given direction on said flat surface, whereby said pin and said given direction on said flat surface define a plane, said base member further having a second surface opposite said flat surface, a first projection spaced from said pin in said given direction and extending from said second surface, a clamping member pivotally coupled to said projection for rotation about an axis parallel to said clamping surface, said clamping member having an eccentric portion with



grooves extending parallel to the pivotal axis thereof, and an operating lever extending toward said one end of said base member, whereby movement of said lever toward said base member rotates said eccentric portion to reduce the spacing between said eccentric portion and said second surface, and a second projection on said base member spaced in said given direction from said first projection and having an aperture positioned to direct a wire or cord to be clamped between said eccentric portion and said second surface, the axial end of said eccentric member away from said projection being exposed to permit a wire or cord to be clamped to be inserted laterally between said eccentric portion and said eccentric surface.

3,995,821

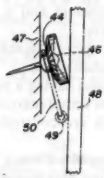
PUSH PIN

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

Division of Ser. No. 489,051, July 16, 1974, Pat. No. 3,911,516. This application July 23, 1975, Ser. No. 598,365

Int. Cl.² A47F *7/14*

U.S. Cl. 248—216 **9 Claims**



1. A push pin comprising a base having first and second opposite sides, and a pin having a blunt end completely embedded in and rigidly held by said base member, said pin having a sharpened end extending centrally from said second side, said second side having a convex surface coaxial with and adjacent said pin, said convex surface having a surface area in the vicinity of the pin that is substantially larger than the cross sectional area of said pin, and an outer surface extending radially outward with respect to said pin and an intermediate surface extending axially with respect to said pin between said convex surface and said outer surface, whereby said outer surface is further spaced from said sharpened end of said pin then said convex surface, in the axial direction of said pin.

3,995,822

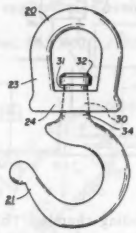
SWIVEL HOOKS AND METHOD FOR MAKING THE SAME

Ruediger Einhorn, Katonah, and Lee Richard Chasen, Port Chester, both of N.Y., assignors to Coats & Clarks, Inc., New Rochelle, N.Y.

Division of Ser. No. 549,313, Feb. 12, 1975. This application Nov. 10, 1975, Ser. No. 630,277

Int. Cl.² A47F *5/00;* **E06B** *7/28*

U.S. Cl. 248—304 **15 Claims**



1. In an articulated article of the type comprising a first element having a frustoconical projection and a second element having a frustoconical aperture fitted on said projection to form an articulated joint, said frustoconical projection having an axial length substantially equal to the axial length of said aperture, the improvement wherein said first element further has an extension on the smaller diameter end thereof and axially aligned with said projection, said extension having a lesser maximum transverse dimension than the minimum diameter of said frustoconical projection and a substantially lesser axial length than said frustoconical projection.

3,995,823

ADJUSTABLE CEILING SUSPENSION

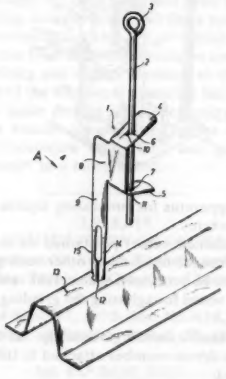
Erich Emil Hensel, Wassenaar, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Oct. 10, 1975, Ser. No. 621,415

Claims priority, application Netherlands, Oct. 14, 1974, 7413507

Int. Cl.² F16L *3/00;* **E04B** *5/52, 5/00*

U.S. Cl. 248—327 **9 Claims**



1. A suspension device for ceilings comprising a clamp, said clamp being shaped from a piece of resilient metal, said clamp including a pair of diverging ears extending therefrom, an

opening in each of said ears, said openings being in alignment with each other, a supporting rod extending through said aligned openings, means for connecting said clamp to a ceiling support element, and at least one of said openings being provided with a cutting edge bent outwardly from the surface of the respective ear of said clamp whereby relative rotation of said clamp and said supporting rod causes said clamp to be screwed longitudinally with respect to said supporting rod.

3,995,824

DEVICE FOR REMOVABLY MOUNTING OF A LENGTHWISE-ADJUSTABLE COLUMN TO A CHAIR SEAT, TABLE TOP, OR THE LIKE

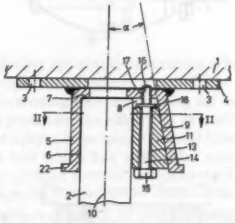
Fritz Bauer, Altdorf, Brd, Germany, assignor to Verin AG, Berneck, Switzerland

Filed May 20, 1975, Ser. No. 579,134

Claims priority, application Germany, June 14, 1974, 2428776

Int. Cl.² A45D *19/04*

U.S. Cl. 248—400 5 Claims



1. In a device for the releasable fastening of a lengthwise adjustable gas spring column, formed of one piece at its upper end, to a seat bottom of an article of seating furniture, with a holding device fastened to the underside of the seat bottom, said holding device being provided with a recess to accept the upper end of the gas spring column, and a gripping device for holding the column in the recess by clamping action, the improvement wherein:

said device for holding the gas spring column is of a generally inverted cup-shape, the bottom of the cup-shaped holding device being fastened to the seat bottom underside with the sides of the cup projecting downwardly over the upper end of the column, the cup-shaped holding device containing two recesses, said gripping device being mounted in a first of said two recesses of said holding device which connects radially with the second of said recesses of said holding device, which second recess accepts the column, said holding device comprising an internal wall which laterally delimits said first recess for said gripping device and which makes a tangential transition to said second recess for the column, said first recess comprising a slightly inclined guide surface;

said gripping device comprises at least one gripping surface which is in the shape of a section of a cylinder and a slightly inclined guide surface opposite said gripping surface and resting on said slightly inclined guide surface of the first recess of said holding device, both said guide surfaces being slightly inclined with respect to the axis of the gas spring column; and

means to displace said gripping device axially to wedge the gas spring column in the second recess of the holding device, said displacing means comprising a tensioning device to force said gripping element in an axial direction, said tensioning device comprising at least one threaded bolt having a head which bolt passes through an unthreaded opening in said gripping device and fits into a thread in the bottom of said holding device, the head of said bolt abutting said gripping device, and means on said threaded bolt to protect said bolt against displacement relative to said gripping device.

3,995,825

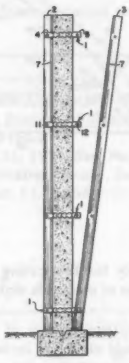
FORM TIE FOR CONCRETE FORM STRUCTURES

Edward B. Ward, and Ronald A. Ward, both of 824 Winchester, Kansas City, Mo. 64125

Filed Aug. 1, 1975, Ser. No. 601,019

Int. Cl.² E04g *11/06*

U.S. Cl. 249—41 7 Claims



7. A form tie for a concrete form structure including first and second side forms positioned in facing relation to define therebetween a space to receive concrete, said side forms each having peripheral side edge portions adapted to be positioned in abutting engagement with an adjacent side form, said concrete form structure including means for holding the abutting side edge portions of adjacent side forms in abutting engagement said form tie comprising:

a. an elongated tie bar extending transversely across a space between facing side forms and having opposite end portions thereof each positioned between respective abutting side edge portions of adjacent side forms, said tie bar being a planar member of carbon steel and having opposite side edge portions and opposite faces;

b. means defining a pair of apertures in said elongated tie bar and each positioned in a respective one of said opposite end portions thereof and each adapted to receive respective means for holding abutting side edge portions of adjacent side forms in abutting engagement;

c. said tie bar having a first and second pair of opposed coined grooves in said opposed faces of said tie bar and extending transversely across same, each pair of opposed grooves being positioned between a respective one of said opposite end portions and an intermediate portion of said tie bar, the tie bar thickness being reduced at said grooves by 30 to 60% of the original thickness of the tie bar thereby defining a pair of work-hardened fracture planes whereby each of said end portions is adapted to be separated from the intermediate portion of said tie bar upon being struck thereon;

d. means defining a plurality of notches in said tie bar and each positioned in a respective one of the opposite side edge portions thereof, certain of said notches being intersected by a respective one of said first and second pair of opposed grooves; and

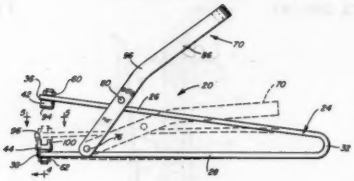
e. the spacing between each of said apertures and the adjacent pair of opposed grooves positions each of said pair of opposed grooves inwardly of an interior face of a respective one of the side forms whereby the intermediate portion of said tie bar may be concealed in a concrete wall.

3,995,826

PELLET MOLD

Eugene Francis Saunders, Columbus, Nebr., assignor to Saunders Archery Company, Columbus, Nebr.

Filed Apr. 21, 1975, Ser. No. 569,796
Int. Cl.² B22D 23/08
U.S. Cl. 249—161 4 Claims



1. A mold assembly for fabricating solid ball-like pellets from a heat-fused mass of moldable material which is a solid at room temperature,

said assembly comprising a pair of cooperating generally hemispherical mold elements including a first and a second dish-shaped open-face mold of a temperature-stable composition,

a lower first bar means and an overlying second bar means, and means coupling said first and said second bar means pivotally relative to one another,

pin means fastened to and carried by said lower bar means and extending transversely thereacross,

mold closing lever means,

said pin means pivotally securing said lever means adjacent an end thereof to said first bar means,

fastener means securing one of said molds to each of said bar means with the open faces of the respective said mold elements presented toward one another in substantial alignment,

a rim-like edge bounding each said dish-shaped mold at a peripheral margin thereof,

spring means for biasing said bar means to urge free ends of said bar means apart and to sustain said mold elements carried thereby in a normally separated position,

camming means carried by said lever means at a position intermediate the ends thereof for stressingly engaging said second bar means,

said camming means being oriented so that upon shifting said lever means pivotally about said pin means said camming means engages and bears upon said second bar means forcibly to oppose and to overcome said spring means, thereby to urge said first and said second bar means and the bar means carried mold elements toward one another into engagement and to effect positive mold closure,

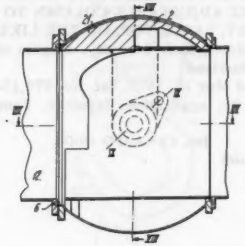
said mold elements being so oriented, as secured to said bar means, that upon immersion of said mold elements in heat-fused material and closure of said mold assembly against the bias of said spring means the edges of said mold elements are brought into contiguous abutment to provide a substantially fluid-tight seal between said mold elements and to define a substantially fluid-tight cavity for retention of a cavity-filling aliquot of said material therewithin.

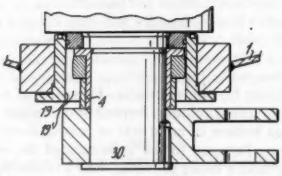
3,995,827

VALVE OPERABLE SOLELY UNDER STILL WATER CONDITIONS, CHIEFLY IN FORCED FLOW CHANNELS

Pierre Piguet, Onex, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Sept. 3, 1974, Ser. No. 503,170
Claims priority, application Switzerland, Sept. 4, 1973, 12661/73
Int. Cl.² F16K 5/20
U.S. Cl. 251—58 4 Claims





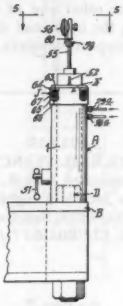
1. A valve for a channel adapted to be set under still water conditions, comprising a valve body in said channel, a seat in said body facing upstream, a valve shutter in said valve body and pivotably shiftable around an axis perpendicular to the axis of the channel from an inoperative valve opening position into an intermediate position spaced from and facing said seat when the channel is set under still water conditions and subsequently displaceable from said intermediate position into a valve closing position in fluidtight contacting relationship with said seat by the pressure of the upstream water when the channel is no longer under still water conditions, cylindrical housings fixedly disposed relative said body, arms rigid with said valve shutter and each having a journal pivotally disposed within said housings to allow pivotal shifting of said shutter between said valve opening and intermediate positions, the exterior of said arm journals defining a clearance between said journals and the interior of said cylindrical housings, interconnection means joined between said valve body and said arm journals for radially displacing said journals within said clearances between a first position in which the pivotal movement of the shutter carrying journals can take place under still water conditions and a second position in which said journals together with said shutter carrying arms and the shutter are urged into a valve closing position with said shutter engaging said valve body seat, and said interconnection means operable to pivot said journals to displace said shutter from said valve closing position to said valve opening position.

3,995,828

BOLT TENSIONING APPARATUS

Joseph N. Orban, Cranford, N.J., assignor to Biach Industries, Inc., Cranford, N.J.

Filed Sept. 16, 1975, Ser. No. 613,967
Int. Cl.² E21B 19/00
U.S. Cl. 254—29 A 11 Claims



1. A bolt tensioning apparatus comprising a housing having at one end a reciprocable motor, a puller bar connected to said motor and extending into the housing for movement into upper and lower positions, the other end of said housing being adapted to be set upon a structure in coaxial loosely surrounding relation to a bolt which has a threaded nut-carrying portion and an upper portion formed for connection of the bolt to said puller bar, a puller bar socket to connect the puller bar to the bolt comprising a plurality of complemental socket segments mounted on said puller bar in encircling relation thereto and movable with the puller bar and toward and from the axis thereof, each segment including an upper mounting portion connected to the puller bar and a lower body portion having an inner surface for cooperative relation with said upper portion of the bolt to connect the puller bar to the bolt for applying tension to the bolt upon upward movement of the puller bar, a sleeve in said housing surrounding said socket segments and movable into upper and lower positions, said sleeve and said segments having coactive portions for actuating said segments into and holding them in said cooperative relation to said bolt and for actuating said segments out of said cooperative relation upon movement of said sleeve into said lower position and said upper position, respectively, and reciprocable power-operated apparatus connected to the upper end of said sleeve for actuating said sleeve into said upper and lower positions.

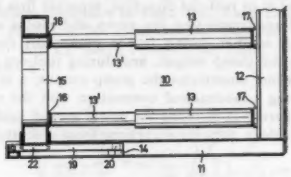
3,995,829

TUBE DRIVING APPARATUS

Adolf Foik, Munich-Krailling, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Germany

Filed Jan. 2, 1976, Ser. No. 646,329
Claims priority, application Germany, Jan. 9, 1975, 2500614
Int. Cl.² E21B 19/00
U.S. Cl. 254—29 R 17 Claims

1. A tube-driving apparatus which includes force-applying means engageable with a pipe and movable to drive said pipe into the ground, means for mounting said force-applying means for movement about a rotational axis extending parallel to the driving direction and means for pre-adjusting the force-applying means in relation to said rotational axis whereby to



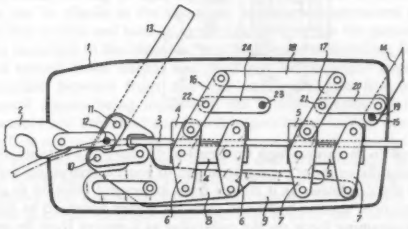
control the torsional force imparted to the pipe during the driving operation.

3,995,830

CABLE TRACTION AND HOISTING APPARATUS

Andre Emile Desplats, Boulogne Billancourt, France, assignor to O.G.E.C., Paris, France

Filed Dec. 31, 1975, Ser. No. 645,606
Claims priority, application France, Jan. 3, 1975, 75.00164
Int. Cl.² B66F 3/00
U.S. Cl. 254—76 2 Claims



1. Cable traction and hoisting apparatus comprising, within a casing, a pair of clamps reciprocally movable within the casing and adapted alternatively to grip or release the cable, a hauling control lever mounted on a first shaft passing through the casing, said first shaft being rigid with a first crank shaft connected through control levers and links to said clamps to control the movement of the clamps resulting in the hauling of the cable, a release control lever mounted on a second shaft passing through the casing and being rigid with a second crank shaft connected through a rod to the middle portion of a first lever, said first lever being pivoted at one end to the control links of one clamp and being connected at its other end, through a rod, to one end of a second lever, said second lever being pivoted at its other end to the control links of the other clamp and having its middle portion pivoted about a fixed axis, so that a rotation of the release control lever results in a translation movement of said first lever and a rotation movement of said second lever.

3,995,831

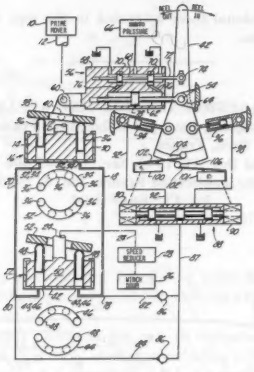
FORCE FEEDBACK CONTROLLED WINCH

Paul L. Spanski, Bloomfield Hills, and Ronald R. Beck, St. Clair Shores, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,567
Int. Cl.² B66D 1/48
U.S. Cl. 254—173 R 4 Claims

1. In combination, a power means for rotating a winch drum in the reel-in or reel-out directions; said power means comprising a variable displacement pump having a mechanically-operated volume adjuster movable in opposite directions from

a neutral zero flow position to a high flow reel-in position or to a high flow reel-out position, a fixed displacement hydraulic motor energized by the pump output to drive a winch drum in either a reel-in or reel-out direction; separate first and second hydraulic lines connecting the pump and motor in a closed loop circuit so that during reel-in operations the first line constitutes the pump output, and during reel-out operations the second line constitutes the pump output; a manual controller having a mechanical connection with the volume adjuster for thereby controlling the power means, said controller being movable in opposite directions from a neutral zero flow



position to various high flow reel-in or reel-out positions; first hydraulic cylinder means arranged to exert a restraining force on the controller as it moves from its neutral position in one direction; second hydraulic cylinder means arranged to exert a restraining force on the controller as it moves from its neutral position in the other direction; a first sensor line transmitting pump output pressure to the first hydraulic cylinder means only when the controller is in the reel-in operational mode; and a second sensor line transmitting pump output pressure to the second hydraulic cylinder means only when the controller is in the reel-out operational mode.

3,995,832

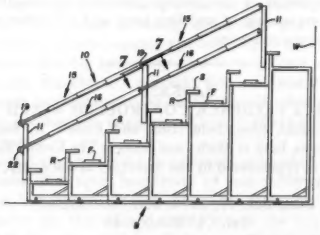
COLLAPSIBLE BLEACHER RAIL

Harold Wiese, Madison, S. Dak. 57042

Filed Oct. 10, 1973, Ser. No. 404,994

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **10 Claims**



1. In a seating structure combined with a hand rail, the improvement comprising:

a. at least a pair of spaced, generally vertical support members;

b. means for attaching the lower ends of said support members in ascending, spaced relation to said seating structure;

c. a rail member having sections in telescoping relationship providing joints between said sections at spaced positions along said rail member;

d. means for pivotally attaching one end of said rail member to one of said vertical support member; and

e. pivot means at the other end of said rail member for pivotally attaching the other end of said rail member to the other of said support members.

3,995,833

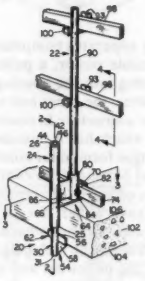
REMOVABLE GUARD RAIL STANCHION APPARATUS

Jack McLaughlin, Orange, and John R. McCoy, Carson, both of Calif., assignors to Jack McLaughlin, Orange, Calif.

Filed July 23, 1975, Ser. No. 598,440

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **25 Claims**



1. A removable guard rail stanchion apparatus which comprises:

a. a stanchion having portions thereof adapted for mounting guard rail sections,

b. clamping means adapted for clamping to edge portions of a mounting structure,

said clamping means including socket means for receiving lower end portions of said stanchion and,

c. locking means for releasably retaining said lower end portions in said socket means, whereby said lower end portions may be firmly locked in said socket means and may be unlocked and easily removed thereform and subsequently reinstalled therein without unclamping of said clamping means from a mounting structure.

3,995,834

SUPPORTS FOR GUARD RAILS

Samuel T. Melfi, 1601 NW. 1st Court, Boca Raton, Fla. 33432

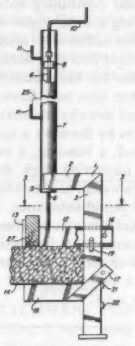
Filed July 28, 1975, Ser. No. 599,400

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **3 Claims**

1. A clamp for guard rails comprising, a frame, a tubular post secured to and rising upwardly from the frame, said post being open at the top, a threaded rod extending axially through the post and adjustable therethrough from the upper end of the post, a first clamping bar slidable along the frame and held against a building element by pressure imposed on it by the threaded rod, said rod being adjustable from the top of the post to regulate such pressure, the post having means for supporting guard rails, a second clamping bar movably adjustable on the frame, said second adjustable clamping bar engag-

ing the building element between it and the first clamping bar, the second clamping bar having an angular arm embracing the



frame, said arm being slidably adjustable on the frame upon tilting movement of the second clamping bar.

3,995,835

MAGNETIC MIXER

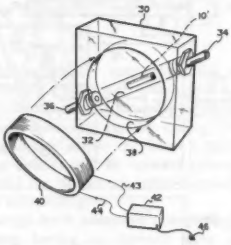
Robert D. Cichy, Maumee, Ohio; Anthony P. Schmid, Riga, Mich., and Barry Watson, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed July 8, 1974, Ser. No. 486,614

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² B01F *13/08*

U.S. Cl. 259—4 R **2 Claims**



1. A magnetic mixing device for mixing a moving fluid stream which comprises, in combination:

a block of non-magnetic material, said block including a recess formed in one face thereof and further including a passage extending completely therethrough behind said recess in close proximity thereto but not in communication with said recess, said passage defining a flow tube;

a elongated magnetic stirring element contained within said passage;

means for limiting the travel of said stirring element, in engagement with both ends of said passage, to prevent movement of said stirring element out of said flow tube and to allow movement of said fluid stream through said passage;

a coil formed of electrically conductive material positioned in said recess in said block; and

means for furnishing a low voltage oscillating electrical supply to said coil to thereby generate an oscillating magnetic field in said passage for causing said magnetic stirring element to oscillate longitudinally in said passage.

3,995,836

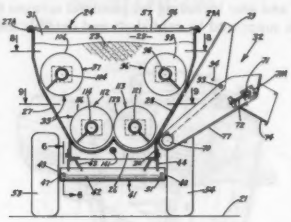
MATERIAL MIXING AND FEEDING APPARATUS

Thomas M. Carter, Wayzata, and Walter W. Wolfe, Mound, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 30, 1975, Ser. No. 545,505

Int. Cl.² B01F *7/00, 15/00, 15/02*

U.S. Cl. 259—6 **28 Claims**



1. An apparatus for mixing particulate materials comprising: box means having upright front and rear end walls and and side walls surrounding a chamber for accommodating particulate materials, one of said side walls having a discharge opening located between the ends of the one side wall, said box means having an open top whereby the particulate materials can be placed in the chamber, auger means mounted on the box means and located in the chamber to mix the particulate materials in the chamber, said auger means including first and second lower augers and third and fourth upper augers extended between front and rear end walls, said first and second augers being located in the bottom section of the chamber and said third and fourth augers being located above the first and second augers and positioned generally parallel to the first and second augers, each of said first, second, third and fourth aguers having two spiral flights with opposite spiral patterns, said first auger having a first spiral flight operable to move material from the front end wall toward the discharge opening and second spiral flight operable to move material from the rear end wall to the discharge opening, said second auger having a first spiral flight and a second spiral flight operable to move material from the midsection of the chamber toward the front and rear end walls, said third and fourth augers each having first and second spiral flights, one of said third and fourth augers being operable to move material from the front and rear walls toward the midsection of the chamber, the other of said third and fourth augers being operable to move material from the midsection to the front and rear end walls, drive means for rotating the first and second augers in opposite directions and for rotating the third and fourth augers in opposite directions, open means mounted on the box means and located over the entire open top of the box means to prevent large objects from entering the chamber and allowing particulate materials to be placed in the chamber, and door means for selectively opening and closing the discharge opening whereby particulate materials are discharged from the chamber when the door means is open.

3,995,837

APPARATUS FOR MIXING FOUNDRY MATERIALS

Raymond Arthur Parsonage, West Bromwich, and Harold Higgs, Wolverhampton, both of England, assignors to Fordath Limited, West Bromwich, England

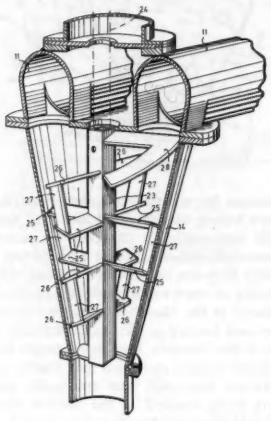
Filed July 11, 1975, Ser. No. 595,042

Int. Cl.² B01F *7/24*

U.S. Cl. 259—8 **4 Claims**

1. Apparatus for mixing foundry sand and rapid setting binder comprising means for preparing a separate sand/binder mixture and a separate sand/catalyst mixture, a vertical mixing chamber, and means for conveying said mixtures separately into the upper end of said mixing chamber having a discharge aperture at its lower end and a rotatable shaft extending down-

wardly and centrally through the chamber, mixing means contained within the mixing chamber for mixing the two mixtures together as they fall through said mixing chamber including radially extending blades on said shaft which are spaced longitudinally along said shaft, some of said radial blades being mixer blades said mixer blades being oriented to direct the mixture material downwardly and some being deflector blades said deflector blades being oriented to deflect material upwardly, and also including longitudinal scraper blades each of which is supported by said shaft and extends longitudinally



along said shaft so as to move over the internal surface of the mixing chamber to provide a scraping action to prevent build up of material on said surface, said scraper blades being spaced apart longitudinally along said and oriented to deflect material in a generally radially inwards direction in relation to the rotatably driven shaft to which the blades are attached said mixer and deflector blades being arranged on said shaft in pairs of longitudinally spaced blades with one blade directly below another, there being one of said scraper blades extending between and attached to the two blades of each pair at the outer extremities thereof.

3,995,838

ARRANGEMENT FOR THE PRODUCTION OF A SUSPENSION OF HIGHLY SWELLABLE SUBSTANCES

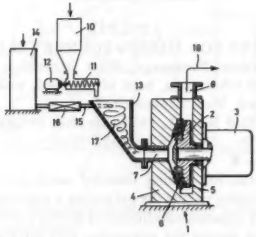
Friedrich J. Zucker, Norf, Germany, assignor to Supraton Auer & Zucker OHG, Allwrheiligen, Germany

Filed Jan. 20, 1975, Ser. No. 542,274

Claims priority, application Germany, Jan. 23, 1974, 2403053

Int. Cl.² B01F *3/10, 5/08*

U.S. Cl. 259—10 **4 Claims**



1. Apparatus for the production of a highly swellable solid-liquid substance from solid and liquid components comprising means for continuously metering a solid expandable component, means for continuously metering a liquid component, means for continuously combining the metered solid and liquid components, said combining means includes a funnel-shaped container having a wide upper tapered inlet end and a narrower tapered lower outlet end, means for introducing the metered solid component into said funnel-shaped container at said upper end, means for tangentially introducing the metered liquid component into said funnel-shaped container at said upper tapered end thereby premixing the combined solid and liquid components by forming a spirally and downwardly narrowing flow thereof, a housing, a mixing chamber in said housing, means for imparting high shearing forces to said premixed components within said mixing chamber to form the highly swellable solid-liquid substance, an outlet for removing the substance from said mixing chamber, an inlet for introducing said premixed components into said mixing chamber, an outlet at said funnel-shaped container lower end, and said last-mentioned outlet being disposed immediately adjacent said mixing chamber inlet.

3,995,839

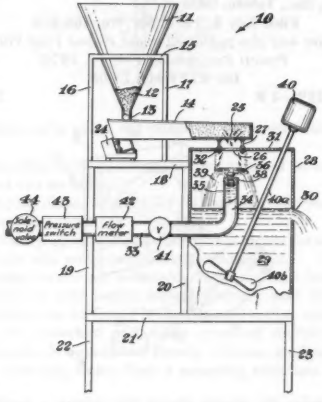
APPARATUS AND METHOD FOR WETTING DRY PARTICLES AND DISPERSING THE PARTICLES IN A LIQUID

Warren M. Zingg, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 28, 1975, Ser. No. 636,239

Int. Cl.² B01F *5/18, 5/26*

U.S. Cl. 259—22 **6 Claims**



6. A method for wetting dry particles and dispersing the particles in a liquid, the method comprising the steps of:

storing a charge of dry particles in a hopper;

delivering the dry particles from the hopper into a feeder tray, the tray having a discharge opening therein and a plate member secured to the tray directly below the discharge opening;

positioning the plate member inside a closed container which is located below the feeder tray, the container including a body of liquid;

vibrating the feeder tray and plate member to cause the dry particles to drop through the discharge opening and onto the plate member;

positioning a vertical conduit section in the closed container directly below the center of the plate member, the conduit section having a deflector member fitted therein;

flowing a liquid stream upwardly through the vertical conduit to cause the stream to strike the deflector member;

discharging the deflected stream from the vertical conduit

in the form of a circular liquid spout which falls into the liquid in the container;

dropping the dry particles from the plate member in the form of a circular particle curtain which strikes the liquid spout;

wetting the dry particles in the liquid spout and carrying the wetted particles into the liquid in the container;

agitating the liquid in the container to thereby disperse the wetted particles into the liquid in the container.

3,995,840

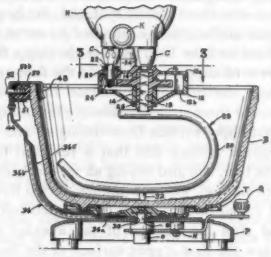
DOUGHMAKER ATTACHMENT FOR KITCHEN MIXER

C. Louis Smader, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed June 30, 1975, Ser. No. 591,496

Int. Cl.² B01F 7/16

U.S. Cl. 259—107 3 Claims



1. A rugged doughmaker attachment for a conventional electric mixer having a base with a turntable having a central shaft, the turntable supporting a mixing bowl, the base having an upward column mounting a motor casing, the motor casing having in its underside above the bowl a pair of downward beater-receiving chucks and an upward opening with clamp means for holding the beater-assembly-support of the mixer, the attachment comprising:

a. a sturdy dough hook assembly comprising:

1. a housing having an upward stem adapted to be clamped into the opening to support the housing in a stationary manner;

2. a speed-reducing gear train in the housing having an input shaft operatively engageable with one of the chucks and a downward output shaft disposed centrally of the housing;

3. a dough hook integral with the lower end of the output shaft and adapted to operate in the bowl; and

b. means for immobilizing the bowl including:

1. a downward stud integral with and depending from the lowermost part of the dough hook substantially at the vertical axis of rotation thereof, the stud adapted to engage the bowl bottom to keep the bowl down, and

2. arm means braking rotation of the bowl, the arm means having an aperture in the lower portion thereof, the aperture receiving the shaft of the turntable thereby at least partly immobilizing the arm means, the arm means extending upward to a point adjacent the rim of the bowl and bowl-rim-gripping means at the point securing the top of the arm to the bowl adjacent the rim thereof.

3,995,841

CONVERTER DRIVE AND BEARING ARRANGEMENT

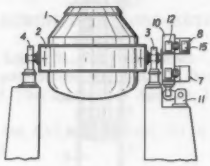
Ernst Riegler, Enns; Manfred Schmidt, and Horst Wimmer, both of Linz, all of Austria, assignors to Vereinigte Osterreichische und Eisen- Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 17, 1975, Ser. No. 632,794

Claims priority, application Austria, Dec. 9, 1974, 9799/74

Int. Cl.² C21C 5/50

U.S. Cl. 266—246 14 Claims



1. In a converter drive and bearing arrangement with converter carrying bearings and converter drive means for preventing a transmission of converter oscillations onto the converter carrying bearings and the converter drive means while the converter is in blowing phase, which arrangement comprises

a converter,

a converter carrying ring,

two converter carrying trunnions arranged on the carrying ring,

a fixed bearing accommodating one of the converter carrying trunnions,

an expansion bearing accommodating the second of the converter carrying trunnions,

a spur gear with a spur gear wheel,

a plurality of slip-on gears having drive pinions and being peripherally arranged on the spur gear wheel of the spur gear, at least one of the converter carrying trunnions being driven by the spur gear,

the improvement comprising that during the blowing phase of the converter at least one of the drive pinions of one of the slip-on gears is braced relative to the spur gear wheel of the spur gear and wherein there is no torsion-flank-play.

3,995,842

PNEUMATIC SPRING WITH SAFETY RELEASE

Herbert Freitag, Koblenz-Metternich, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed Dec. 2, 1975, Ser. No. 637,071

Claims priority, application Germany, Dec. 7, 1974, 2457938

Int. Cl.² F16F 5/00

U.S. Cl. 267—64 R 6 Claims

1. A pneumatic spring comprising:

a. a cylinder member having an axis and defining a cavity therein,

1. said cylinder member being formed with a circumferentially elongated groove open toward the atmosphere outside said cavity,

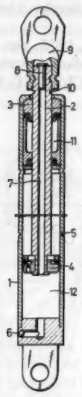
2. a wall portion of said cylinder being of reduced thickness, said wall portion forming the bottom of said groove and separating said cavity from said atmosphere;

b. a piston axially movable in said cavity and separating two compartments in said cavity, said piston being formed with a throttling passage connecting said compartments;

c. a piston rod member having an inner end portion fastened to said piston for joint axial movement and an outer end portion in the atmosphere outside said cavity, said piston rod member passing through said cylinder member in sealing engagement; and

d. a body of gas in said compartments under a pressure higher than the pressure of said atmosphere,

l. said wall portion constituting normally closed, frangi-



ble safety valve means responsive to a predetermined stress in said cylinder member for releasing said body of gas to said atmosphere through an aperture in said cylinder member.

3,995,843

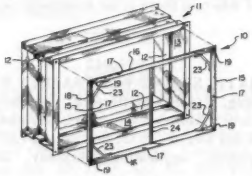
APPARATUS FOR SUPPORTING A WINDOW BUCK FRAME

Fred J. Kasteler, 1851 London Plane Road, Salt Lake City, Utah 84117

Filed Aug. 13, 1973, Ser. No. 388,053

Int. Cl.² E04G *15/02*

U.S. Cl. 269—47 **2 Claims**



1. A support frame for installation in a window buck frame that has a center ridge extending peripherally into a window opening thereof, said support frame comprising

pairs of spaced apart vertical and spaced apart horizontal structural support members connected to form a rectangle having outermost peripheral dimensions just smaller than the inside window opening dimensions of said window buck frame, and larger than the inside dimensions of the center ridge of the window buck frame, the area between said vertical and horizontal structural members being sufficiently open to allow form ties to be passed therethrough; and

means for releasably clamping said formed rectangle to said center ridge, inside said window buck frame, said means comprising clamp means connected to one of the support members and having a leg extending therefrom to reach over the center ridge and means for releasably tightening the leg means to the support member and against the ridge means.

3,995,844

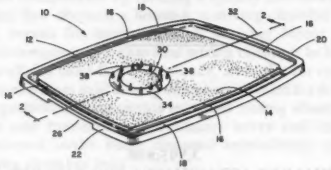
CARVING BOARD

Werner Hellman, Baraboo, Wis., assignor to Flambeau Products Corporation, Baraboo, Wis.

Continuation of Ser. No. 576,982, May 13, 1975, abandoned. This application Feb. 26, 1976, Ser. No. 661,538

Int. Cl.² B23Q *1/00*

U.S. Cl. 269—54.5 **2 Claims**

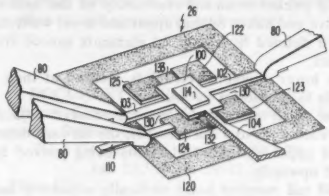


1. An improved spike-ring carving board for holding and cutting foods and the like comprising: a one piece board made of a hard, non-absorbent plastic material, the board having a first, flat upper surface that is adapted to serve as a cutting surface for food and the like, and also having a flat base surface that serves to support and steady the first upper surface during cutting; the first upper surface having a texturized pattern engraved thereon that assists in preventing food being cut on the first upper surface from sliding on and with respect to the first upper surface and that is resistant to cutting by knives and the like, and also having an upwardly open, annular recess formed therein, with the annular recess having a preselected inner radial dimension, a preselected outer radial dimension and with the bottom of the annular recess being disposed below the first, upper surface of the board a preselected depth and being closed so as to prevent any fluid leakage from the annular recess to the flat base surface; an annular spike-ring disposed in the annular recess and including a base portion having upper and lower surfaces, the base portion of the spike-ring having an inner radial dimension substantially equal to the preselected inner radial dimension of the annular recess, having an outer radial dimension substantially equal to the preselected outer radial dimension of the annular recess and having a thickness, as measured between its upper and lower surfaces, substantially equal to the preselected depth of the annular recess so that when the spike-ring is disposed in the annular recess, the base portion of the spike-ring substantially fills the annular recess and the upper surface of the base portion of the spike-ring is substantially parallel to and coplanar with the first upper surface of the board; first and second sets of upstanding spikes, each of the upstanding spikes having a lower end that is mounted on the upper surface of the base portion of the spike-ring, and an upper pointed end that projects upwardly above the first surface of the board when the spike-ring is disposed in the annular recess and that is adapted to engage and hold the food and the like to be cut; the first set of upstanding spikes being arranged on the spike-ring in a first circle about the center of the spike-ring, the second set of the upstanding spikes being arranged on the spike-ring in a second circle, with the first circle being disposed radially inwardly from the second circle, with the upstanding spikes in the first set of upstanding spikes being angularly equi-spaced from each other and with the upstanding spikes in the second set of spikes being angularly equi-spaced from each other and being angularly equi-spaced from the upstanding spikes in the first set of upstanding spikes.

3,995,845
ULTRASONIC WIRE BONDING CHUCK

Harvey Dow Gibson Scheffer, Westfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,375
Int. Cl.² B23K 1/06, 37/04; H05K 3/32
U.S. Cl. 269—254 CS 12 Claims



1. A clamp for securing a device including a plurality of finger-like leads extending radially outwardly from a central pad and radially inwardly from an annular frame terminating adjacent said central pad, said clamp securing said device during ultrasonic bonding of interconnecting wires to said leads comprising:

first and second clamping jaws for clamping said fingers therebetween,

means coupled to said jaws for causing said jaws to assume a clamp and unclamp position,

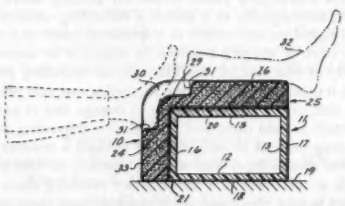
said first jaw having a clamping surface formed of a plurality of finger gripping microscopic nodules and voids, said nodules and voids being the microstructure of said clamping surface when said surface is formed by an electrical discharge machining process,

said second jaw including an annular array of finger-like jaws extending radially inwardly toward each other, said finger-like jaws each having a clamping surface disposed facing said first jaw clamping surface, said finger-like jaws clamping surfaces being formed of a plurality of said microscopic nodules and voids, each finger-like jaw corresponding to a different one of said leads for clamping that corresponding lead to said first jaw, said clamping surface gripping each said lead independently of the other leads and substantially eliminating slippage of any of said leads during said bonding.

3,995,846
MEANS SUPPORTING AN EXTREMITY OF THE BODY DURING THE APPLICATION OF A CAST

Mary A. LaRooka Frick, 1118 South 11th St., St. Charles, Ill. 60174

Filed Mar. 3, 1976, Ser. No. 663,574
Int. Cl.² A61F 5/04
U.S. Cl. 269—328 18 Claims



1. An extremity support device for extremities of the body to assist a physician in treating the extremity, comprising:

a rigid framework having a bottom wall of a given dimension and an end wall of a dimension different from said given dimension, said walls being adapted to contact a support surface;

a support pad attached to at least one wall of said framework;

said support pad having a recess therein formed to fit a portion of an extremity of a patient and support the extremity in an elevated position;

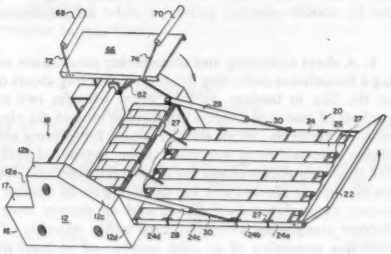
said bottom and end walls having a non-skid material thereon;

said bottom and end walls of said framework being so arranged as to support the extremity at one elevation when resting on the bottom wall and at another elevation when resting on the end wall.

3,995,847
OFFICE MACHINE INCLUDING RETRACTABLE FEEDER

Joseph Schiff, 5 Lipski St., Tel Aviv, Israel

Continuation-in-part of Ser. No. 428,867, Dec. 27, 1973, Pat. No. 3,891,203. This application Apr. 28, 1975, Ser. No. 572,188
Int. Cl.² B65H 37/04, 3/116
U.S. Cl. 270—58 12 Claims



1. An office machine comprising:

a machine casing;

means within the casing for processing a plurality of flat articles;

a first input feeder feeding the flat articles from a supply station at the input side of the casing to a processing station within the casing;

a second input feeder feeding further articles to the processing station to be processed with the flat articles from the supply station;

and an output feeder at the output side of the casing for feeding the articles away from the processing station;

said output feeder comprising a conveyor belt and a conveyor platform supporting the belt, the conveyor platform including a plurality of hinged sections permitting the platform and the conveyor belt supported thereby to be disposed in either an extended operating position wherein the hinged platform sections are extended for conveying the flat articles, or in a folded non-operating position wherein the hinged platform sections are folded over the machine casing;

said second input feeder including a retractable support supporting same in a projected position external of the machine casing when the conveyor platform is in its extended operative position, or in a retracted position within the machine casing when the conveyor is in its folded non-operative position.

10. An office machine including a feeder for feeding flat articles from the bottom of a stack in a supply station; comprising: an elongated member extending across the entrance of the feeder and formed with a rounded lower end facing said entrance, said elongated member having a cross-sectional shape substantially of a quarter-sector of a circle; a roller disposed under the elongated member in alignment with its rounded lower end, and pivotable mounting means pivotably supporting the elongated member laterally of the axis of said roller in the direction towards said entrance, whereby the rounded lower end of the elongated member is urged against

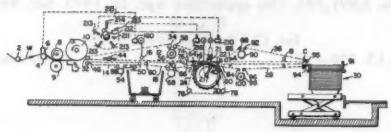
the roller by the weight of the elongated member, the surface friction of the roller being greater than that of the rounded lower end of the elongated member to effect the feed of one flat article at a time therebetween.

3,995,848

TANDEM COLLECT SINGLE WEB SHEET CUTTER AND STACKER

David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 484,248, June 28, 1974, Pat. No. 3,935,769. This application Sept. 25, 1975, Ser. No. 616,646
Int. Cl.² B65H *39/08*
U.S. Cl. 270—60 **2 Claims**



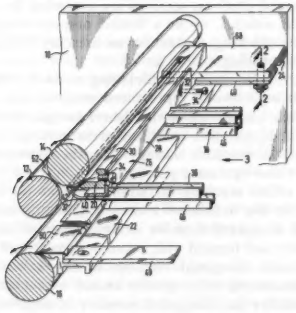
1. A sheet collecting and transferring mechanism comprising a foraminous collecting drum for collecting sheets of paper or the like in tandem on said drum wherein two or more packets of associated sheets are formed around the circumference of the drum, an air shower means for guiding individual sheets onto said drum into said tandem registered packets and for removing accumulated sheet packets from said drum, and an air shower control unit for supplying air to said air shower means at predetermined times, said air shower control unit further comprising a rotating cam and a plurality of microswitches consisting of an odd number of at least five, said microswitches being engaged by said cam in sequence, with one of said microswitches being adapted to actuate the air shower means for removing accumulated sheet packets from said drum and the remainder of said microswitches being adapted to actuate the air shower means for guiding the individual sheets onto said drum.

3,995,849

SHEET FOLDING MACHINE WITH ROLLERS AND A POCKET

Hermann Kistner, Panoramaweg 4, 7141 Neckarweihingen, Germany

Continuation of Ser. No. 64,348, Aug. 17, 1970, abandoned. This application June 26, 1975, Ser. No. 590,728
Int. Cl.² B65H *45/14*
U.S. Cl. 270—68 A **11 Claims**



1. A paper folding machine of the buckle folding type, including,

a. means for feeding sheet material,

b. a sheet receiving pocket for receiving sheet material fed by said feed means,

c. the interior of said pocket defined by generally planar and horizontally disposed upper and lower walls,

d. a forward entrance to said pocket, said entrance defined by upper and lower parallel lip members horizontally disposed, at least the upper lip member being stationary,

e. said pocket bounded rearwardly of the said entrance above and below by said upper and lower walls, said walls each defined by elongated elements spaced from each other,

f. the lower elongated elements secured at their forward ends to said lower lip member,

g. the upper elongated elements secured adjacent their forward ends to a rail member, the forward-most ends of said upper elongated elements being curved forwardly and upwardly,

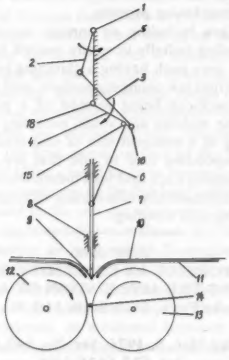
h. said rail member being vertically adjustably secured to said upper lip member for adjusting the vertical distance between said upper and lower walls.

3,995,850

FOLDING OF SHEET-MATERIAL BLANKS

Klaus Hertrich, Goehrenz, and Horst Fenske, Leipzig, both of Germany, assignors to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Division of Ser. No. 301,603, Oct. 27, 1972, Pat. No. 3,904,187. This application Jan. 9, 1975, Ser. No. 539,736
Int. Cl.² B65H *45/18*
U.S. Cl. 270—83 **6 Claims**



1. In an apparatus for folding sheet material blanks, a combination comprising guide means for guiding sheet material blanks, substantially in a plane; a deflecting element guided for straight-line movement in a direction transversely of said plane from a starting position in which it is located in its entirety at one side of said plane to an operating position in which it extends with a portion thereof across said plane to the other side of the latter, whereby to engage and in part deflect the blank in said direction; and motion-imparting means for imparting motion to said element in such a manner that the element moves from said starting position to said plane and travels at relatively slow speed when reaching sheet material located in said plane and upon reaching said sheet material is accelerated to a relatively higher speed while travelling from said plane toward said operating position, said motion-imparting means comprising an anti-parallel crank linkage mounted at said one side of said plane and including a fixedly mounted and rotatable drive shaft which is spaced from said element laterally of said plane, a first crank link having a free first end and a second end which is connected to said drive shaft for turning with the same, a second crank link also having a free

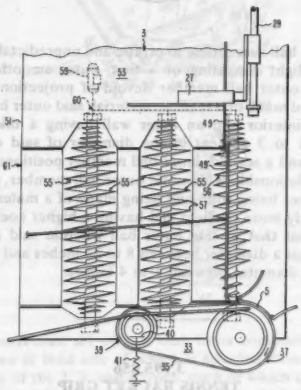
first end and a second end which is pivotally mounted at a fixed location which is spaced from said drive shaft in direction towards said plane, spaced ends each of which is pivoted to a different one of said first ends, and a motion-transmitting element having opposite end portions which are pivoted to said first end of said second crank link and to said element, respectively, so that, in response to rotation of said drive shaft, said crank links pivot in mutually opposite directions and impart motion to said element in said manner.

3,995,851

DOCUMENT JOGGER TRANSPORT

Mark S. Casper, Grosse Pointe, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1975, Ser. No. 618,929
Int. Cl.² B65H *29/42*
U.S. Cl. 271—179 **10 Claims**



1. A document feeding apparatus having an inclined vibratile hopper for receiving a stack of documents edgewise and for advancing said stack towards a document feed means for serial removal from said hopper, said hopper including rotatable auger means for dividing said stack into packs and for advancing successive packs toward said document feed means, said auger means having thread means having a pitch and diameter at an intermediate portion between the ends of said thread maans of sufficient width to allow said successive packs of documents to be vibrationally aligned while said auger is being rotated, said pitch and said diameter of said thread means both tapering from said intermediate portion towards the ends of said thread means to successively facilitate (1) the division of said stack into packs at one end of said thread means, (2) the mutual alignment of the documents in each pack at said intermediate portion, and (3) the compression of said packs while advancing said documents towards the document feed means at the other end of said thread means.

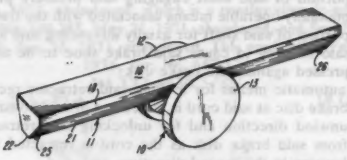
3,995,852

TEETER BOARD DEVICE

Barry Mendelson, 1 Topaz Court, Spring Valley, N.Y. 10977

Filed Aug. 8, 1975, Ser. No. 603,040
Int. Cl.² A63B *23/04*
U.S. Cl. 272—111 **9 Claims**

1. A teeter board device, including a base formed for free rolling motion over a supporting surface and providing thereon a relatively elevated bearing portion, said base having a circumferential groove which is substantially V-shaped in cross section, wall surfaces of said base defining said groove being interconnected by said elevated bearing portion, a beam disposed in substantially overlying relation to said base and having freely projecting ends on which riders may position themselves, the undersurface of said beam being complementarily shaped to nest in said groove in substantially bearing engagement with said wall surfaces, cooperating therewith to thereby dissipate therebetween any forces which might otherwise tend to induce a lateral displacement of one of said base



or said beam relative the other, and means mounting said beam to said bearing portion of said base, said mounting means being formed to accommodate simultaneous relative rolling motion of said base and relative tilting motion of said beam on said base while inhibiting endwise motion of said beam relative to said base.

3,995,853

EXERCISING DEVICE

Michael E. Deluty, 37 Addington Road, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 481,907, June 21, 1974, Pat. No. 3,885,789. This application May 21, 1975, Ser. No. 579,704
Int. Cl.² A63B *21/22*
U.S. Cl. 272—132 **7 Claims**

1. An exercising device comprising:
a. a housing having a hollow interior and a cord opening;
b. a cord retractor reel mounted for rotation within said housing;
c. a flexible cord fixed to and wrapped around said retractor reel, said cord running from said reel out of said housing through said cord opening;
d. rewind means for continuously urging said retractor reel in the rewind direction;
e. manually adjustable variable resistance friction brake means mounted within said housing for braking said retractor reel in the unwind direction, said friction brake means including an annular brake disk rotatably mounted within said housing co-axial with said retractor reel, an annular brake shoe fixedly mounted within said housing co-axial with said brake disk and in opposing relation thereto, an abrasive surface provided on the opposing side of said brake disk and/or said brake shoe, and manually adjustable means for continuously pressing said brake shoe against said brake disk;
f. said manually adjustable means for continuously pressing

said brake shoe against said brake disk including a resilient element positioned against the non-opposing side of said brake shoe, a pressure plate positioned against said resilient element, a threaded hole formed in said hollow housing adjacent to said pressure plate and in axial alignment with said annular brake shoe, a threaded shaft threadably engaged in said threaded hole, the leading end portion of said shaft engaging said pressure plate, and manually operable means associated with the trailing end portion of said shaft for axially advancing said shaft into said housing to cause said brake shoe to be adjustably pressed against said brake disk;

g. automatic means for locking said retractor reel to said brake disc as said cord is pulled out of said housing in the unwind direction and for unlocking said retractor reel from said brake disk as the cord is retracted into said housing in the rewind direction; and

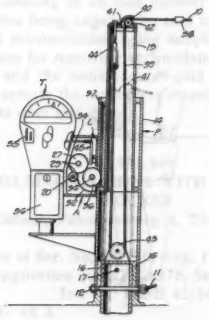
h. said rewind means and said variable resistance friction brake means cooperating to apply a retarding force on said retractor reel to oppose an exteriorly applied manual force pulling said cord in the unwind direction, and said rewind means applying a rotational force on said retractor reel to pull said cord in the rewind direction in the absence of an exteriorly applied manual force on said cord.

3,995,854

COIN CONTROLLED SUPPORT FOR GAME NET

Jack S. Gasaway, 741 Amigos Way, Newport Beach, Calif. 92660

Filed Aug. 23, 1971, Ser. No. 174,017
Int. Cl.² G07F *5/10*
U.S. Cl. 273—29 BB **11 Claims**



1. In a support for a game net for use on a game court, said support including a post having a lower section adapted to be fixedly mounted on the court, an upper post section vertically telescopic with respect to said lower post section for movement between first and second positions, connector means carried by said upper post section and connectable to a game net for disposing said net in a playing position when said upper post secton is in said first position and for disposing said net in a non-playing position when said upper post section is in said second position, actuator means carried by said lower post section and operable on said upper post section for moving said upper post section to said first position from said second position, releasable means for holding said upper post section in said first position, and coin controlled timer means for releasing said releasable means to allow movement of said upper post section to said second position, the improvement comprising:

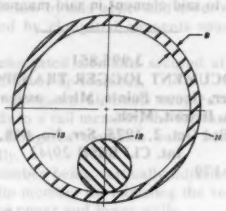
said connector means including a cable connected to said upper post section and extensible and retractable with respect to said upper post section upon telescoping thereof.

3,995,855

TOY BALL

Arthur James Schultz, 5802 Forest Isle Drive, Apt. 586, New Orleans, La. 70114

Filed Nov. 18, 1974, Ser. No. 524,460
Int. Cl.² A63B *37/10, 39/00, 43/04*
U.S. Cl. 273—58 F **6 Claims**



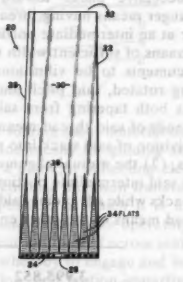
1. A toy ball susceptible to erratic and unpredictable movement in flight consisting of a first, outer smooth-surfaced spherical, outer ball member devoid of projections such as tethers, and made of a resilient material, said outer ball having a hollow interior and an outer wall having a thickness of between 1 to 3 percent of the diameter of said outer ball member; and a second, inner ball member positioned in free-moving relationship within said outer ball member, said inner ball member being solid and being made of a material that is significantly more resilient and having a higher coefficient of friction that that of said outer ball wherein said outer ball member has a diameter between 8 to 24 inches and said inner ball has a diameter between 1 to 4 inches.

3,995,856

TENNIS RACKET GRIP

Frank G. Hollendorfer, Jr., 839 Renninger Road, Akron, Ohio 44319, assignor to Eaton Corporation, Cleveland, Ohio

Filed June 3, 1975, Ser. No. 583,497
Int. Cl.² A63B *49/08*
U.S. Cl. 273—75 **5 Claims**



1. An improved molded, one-piece, slip-on grip for non-rotational retention on the elongated handles of tennis rackets and the like of the type comprising an elongated sleeve having an open end and a closed end, said improvement comprising:

a plurality of axially extending circumferentially spaced internal flats formed in the internal surface of said grip and forming an equilateral polygon adjacent the closed end thereof, said flats are of decreasing circumferential extension away from said closed end and terminate at an axial distance from said closed end which is in the range of 15% to 65% of axial length of said grip.

3,995,857

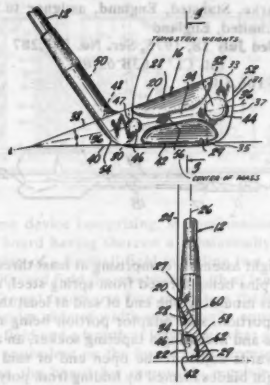
GOLF CLUB HEAD

Alastair J. Cochran, Sutton Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 381,050, July 20, 1973, Pat. No. 3,955,820, which is a continuation-in-part of Ser. No. 311,821, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,255, May 24, 1971, abandoned, and Ser. No. 106,690, Jan. 15, 1971, abandoned. This application Feb. 11, 1976, Ser. No. 657,023

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—77 A 18 Claims



1. A correlated set of golf club irons comprising at least three irons at least one of which is selected from the group consisting of the 2, 3, and 4 irons, each of which comprises a shaft and a steel club head, the steel club head of at least three of the irons having heel and toe portions, weighting means for said club head, said weighting means including added weight in the back of the club head in at least the toe area of the club head of at least 16 grams per cubic centimeter, and said weighting means further including at least one indentation in the back of the club head between the heel and toe portions, the mass and position of the added weight and the size and position of the indentation being sufficient in combination to provide the club head with a radius of gyration about an axis which is parallel to the axis of the shaft and which passes through the centroid of the club head within about the following limits for the at least three irons:

IRON	MINIMUM RADIUS OF GYRATION (Inches)	MAXIMUM RADIUS OF GYRATION (Inches)
2	1.06	1.17
3	1.07	1.18
4	1.08	1.19
5	1.09	1.20
6	1.10	1.21
7	1.11	1.22
8	1.12	1.23
9	1.13	1.24
10	1.14	1.25,

the entire back of the club head being located on one side of an area defined by a plane which is parallel to the axis of the golf club shaft and tangential to the top of the back of the club head.

3,995,858

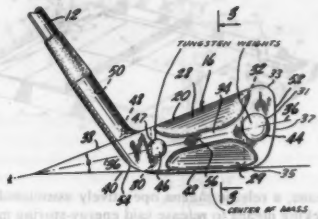
GOLF CLUB HEAD

Alastair J. Cochran, Sutton Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 381,050, July 20, 1973, Pat. No. 3,955,820, which is a continuation-in-part of Ser. No. 311,821, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,255, May 24, 1971, abandoned, and Ser. No. 106,690, Jan. 15, 1971, abandoned. This application Feb. 11, 1976, Ser. No. 657,171

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—77 A 18 Claims



1. A correlated set of golf club irons comprising at least three irons at least one of which is selected from the group consisting of the 2, 3, and 4 irons, each of which comprises a shaft and a steel club head, the steel club head of at least three of the irons having heel and toe portions, weighting means for said club head, said weighting means including added weight in the back of the club head in at least the toe area of the club head of at least 16 grams per cubic centimeter, and said weighting means further including at least one indentation in the back of the club head between the heel and toe portions, the mass and position of the added weight and the size and position of the indentation being sufficient in combination to provide the club head with a radius of gyration about an axis which is parallel to the axis of the shaft and which passes through the centroid of the club head within about the following limits for the at least three irons:

IRON	MINIMUM RADIUS OF GYRATION (Inches)	MAXIMUM RADIUS OF GYRATION (Inches)
2	1.06	1.17
3	1.07	1.18
4	1.08	1.19
5	1.09	1.20
6	1.10	1.21
7	1.11	1.22
8	1.12	1.23
9	1.13	1.24
10	1.14	1.25

3,995,859

COMPETITIVE BOARD GAME AND MECHANICAL ENERGY-STORING CATCH-AND-PROPEL MECHANISM USABLE THEREWITH

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe

Filed Nov. 29, 1974, Ser. No. 528,014

Int. Cl.[2] A63F *7/10*

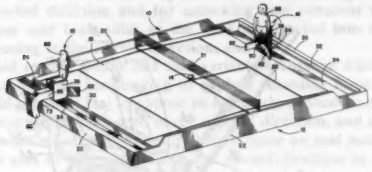
U.S. Cl. 273—85 B 8 Claims

1. A competitive mechanical catch-and-propel board game comprising:

a. a board having an upper playing surface and spaced apart player areas;

b. a spherical object movable over the playing surface; and

c. a pair of mechanical energy-storing catch-and-propel devices operatively associated with said game board, each device having a body portion and a mechanism mounted on the body portion to receive and automatically return the spherical object, each of said devices being disposed at one of said player areas and being adapted for at least translatory movement relative to the playing surface and for angular movement from side to side relative to said playing surface to vary the angle at which the object is returned, each of said mechanisms comprising an energy-storing power means, manually actuable cocking means to cock and thereby store energy in said energy-storing



means, a release means operatively associated with said cocking means to release said energy-storing means from said cocking means, said release means having a trigger member positioned to be engaged and moved by said spherical object to actuate said release means to release said energy-storing means, and a striker member operatively associated with said energy-storing means and movable upon release of said energy-storing means to engage said spherical object and to propel said object toward the other player area essentially instantaneously upon contact of said spherical object with said trigger member, said cocking means being manually actuable after each actuation of said release means.

3,995,860

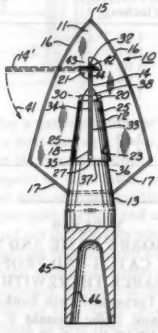
ARROWHEAD WITH REMOVABLE BLADES

Edward L. Manspeaker, Box 408, R.D. 1, Apollo, Pa. 15613

Filed Jan. 9, 1976, Ser. No. 647,659

Int. Cl.² F41B 5/02

U.S. Cl. 273—106.5 B 11 Claims



11. An arrowhead consisting of a flat blade with a leading sharpened point and sharpened perimetral cutting edges extending rearwardly from its leading point,

means defining an opening of predetermined configuration through said blade centered axially of its leading point and the axis of said arrowhead,

a tubular ferrule, the outer symmetrical sides of which fit the inner edges of said opening,

a projectile-shaped body having a transverse slot to embrace the sides of said blade when passed through said ferrule and lock it with said blade and to said projectile-shaped body,

an arrow shaft socket in the rear of said projectile-shaped body positioned axially of said blade point and said arrowhead,

and a cement holding the interengaging parts of said arrowhead together, which cement is readily melted by a low temperature flame applied thereto to disassemble the parts of the arrowhead.

3,995,861

DART FLIGHTS

Robert L. Clarke, Stansted, England, assignor to Clarke & Merrifield Limited, England

Filed July 18, 1975, Ser. No. 597,287

Int. Cl.² A63B 65/02

U.S. Cl. 273—106.5 C 1 Claim

1. A dart flight assembly comprising at least three pins, said at least three pins being formed from spring steel, an adaptor portion, means mounting one end of said at least three pins in said adaptor portion, said adaptor portion being made from polypropylene and including a tapering socket, an annular rib extending inwards adjacent the open end of said socket, at least three flight blades formed by folding from polyester sheet material, said at least three flight blades being held between said at least three pins whereby said flight blades are prevented from rotating with respect to said pins, and a sleeving of plastics material sheathing said at least three pins between said adaptor portion and said at least three flight blades.

3,995,862

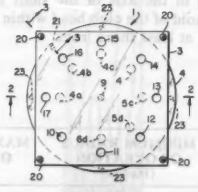
THREE-DIMENSIONAL MATHEMATICAL GAME

George Bertin, 35 W. 93rd St., New York, N.Y. 10025

Filed Aug. 18, 1975, Ser. No. 605,341

Int. Cl.² A63F 3/00, 9/08

U.S. Cl. 273—130 AC 11 Claims



1. A multi-level, three-dimensional game, which comprises:

a. a plurality of transparent or translucent plates arranged in a vertically stacked array, each plate constituting one level and each plate being rotatable about a common vertical axis of rotation;

b. support means for mounting the plates for rotation about said axis;

c. indicia on the plates arranged such that when the plates are in at least one position, relative to each other, and the stacked array is viewed through one of the top or bottom plates, the indicia will appear as at least one set of vertical rows of indicia equidistant from and parallel to said axis, the combination of indicia and their spatial relationship in

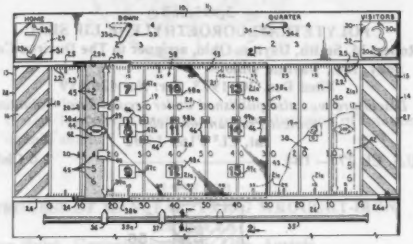
each row in a set being unique, the rows representing numbers in a number system with base b larger than 1, where b is a cardinal number.

3,995,863

FOOTBALL BOARD GAME AND TEACHING AID

Robert E. Cummins, 734 E. Wabash, Carthage, Ill. 62321

Filed Aug. 25, 1975, Ser. No. 607,102
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 CF 7 Claims



1. A game device comprising, in combination,

a game board having thereon a substantially scaled representation of a football field including two end zones and the 100 yard field therebetween, with at least the customary 10 yard transverse line indicators thereon,

a rectangular slide of width substantially equal to the width of the field and a length at least somewhat greater than 50 yards equivalent on the board field representation,

means on the board for removably receiving the slide in engagement therewith operative to permit longitudinal sliding motion of the slide back and forth along the longitudinal axis of the field, with the side edges of the slide substantially in alignment with the sidelines of the field and the end edges of the slide normal to the longitudinal axis of the field,

the slide transparent on one end in substantially 50 yards length equivalent on the board and the full width thereof, whereby the football field center and sideline markings are visible therethrough,

said slide having a transverse line of scrimmage marking thereon on both sides thereof adjacent the end opposite the transparent end thereof, whereby the slide may be turned over and reversed from a first position on the board representing play in one direction on the field to a second position on the board representing play in the other direction on the field.

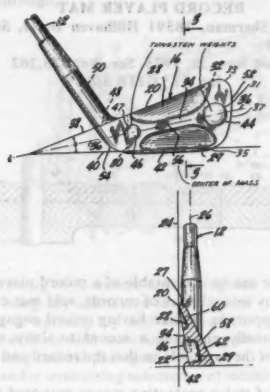
3,995,864

GOLF CLUB HEAD

Alastair J. Cochran, Sutton Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 381,050, July 20, 1973, Pat. No. 3,955,820, which is a continuation-in-part of Ser. No. 311,821, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,255, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 106,690, Jan. 15, 1971, abandoned. This application Feb. 11, 1976, Ser. No. 657,024
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—164 9 Claims

1. A golf club iron comprising a shaft and a steel club having heel and toe portions, weighting means for said club head, said weighting means including added weight of density not less than 16 grams per cubic centimeter inserted into the back of the steel club head at least at the toe area of the club head, and said weighting means further including at least one indentation in the back of the club head between the heel and toe portions, the mass and position of the added weight and the size and position of the indentation being sufficient in combination to provide the club head with a radius of gyration of at least about 1.05 inches measured about an axis which passes



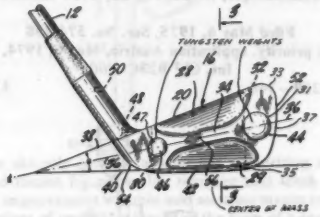
through the centroid of the club head and is parallel to the axis of the shaft of the club, the entire back of the club head being located on one side of an area defined by a plane which is parallel to the axis of the golf club shaft and tangential to the top of the back of the club head.

3,995,865

GOLF CLUB HEAD

Alastair J. Cochran, Sutton Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 381,050, July 20, 1973, Pat. No. 3,955,820, which is a continuation-in-part of Ser. No. 311,821, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,255, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 106,690, Jan. 15, 1971, abandoned. This application Feb. 11, 1976, Ser. No. 657,028
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—167 F 9 Claims



1. A golf club iron comprising a shaft and a steel club head having heel and toe portions, weighting means for said club head, said weighting means including added weight of density not less than 16 grams per cubic centimeter inserted into the back of the steel club head at least at the toe area of the club head, and said weighting means further including at least one indentation in the back of the club head between the heel and toe portions, the mass and position of the added weight and the size and position of the indentation being sufficient in combination to provide the club head with a radius of gyration

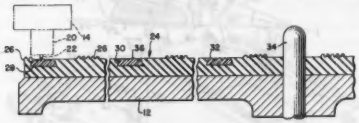
of at least about 1.05 inches measured about an axis which passes through the centroid of the club head and is parallel to the axis of the shaft of the club.

3,995,866

RECORD PLAYER MAT

Harris Leslie Sherman, 18591 Hillhaven Drive, Santa Ana, Calif. 92705

Filed Nov. 25, 1975, Ser. No. 635,202
Int. Cl.² G11B *3/60*
U.S. Cl. 274—1 R **6 Claims**



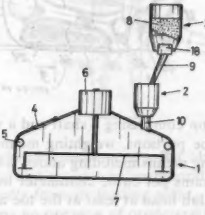
1. A mat for use on a turntable of a record player which is adapted to play several sizes of records, said mat comprising:
   a record supporting surface having record engaging means for frictionally engaging a record to drive same upon rotation of the turntable so that the record can be played; and
   a plurality of stylus protecting means mounted in recesses defined in said record supporting surface, each stylus protecting means being formed of plastic recordlike material which will not damage a record playing stylus upon contact therewith, said stylus protecting means being in the form of separate radially spaced apart concentric rings each inserted into one of said recesses defined in said record supporting surface and each having a plurality of separate substantially circular stylus receiving grooves defined therein, each of said stylus protecting means inserts being located at an initial playing position for each of the several sizes of records played by the record player and to which the stylus will be moved by the record player during automatic operation thereof so that the record playing stylus will engage one of said stylus receiving grooves and be guided in a single substantially circular path until the record player is shut off should the record player be operated in a manner such that the stylus engages the mat during rotation of the turntable.

3,995,867

PROCESS FOR PRODUCING LIGHT WEIGHT CONCRETE

Helmut Katzenberger, Archenweg 52, 6020 Innsbruck, Austria

Filed May 6, 1975, Ser. No. 574,938
Claims priority, application Austria, May 6, 1974, 3695/74
Int. Cl.² B28C *5/00*
U.S. Cl. 259—148 **13 Claims**



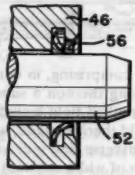
1. In a process for the production of light weight concrete from materials including a binding agent, an inorganic aggregate and a foamed plastic material, wherein a predetermined quantity of granulated plastic material is metered from a reservoir, through a supply means into a concrete mixer operating at a pressure above atmospheric pressure, the improvement comprising:
   subjecting the metered quantity of granulated plastic material, while in said supply means, to a pressure higher than the pressure in said mixer; and
   then transferring said granulated plastic material from said supply means to said mixer and foaming said plastic material in said mixer.

3,995,868

POLYTETRAFLUOROETHYLENE LIP SEAL

Robert M. Smith, Dayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Dec. 20, 1973, Ser. No. 426,819
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² F16J *15/32*
U.S. Cl. 277—184 **6 Claims**



1. A polytetrafluoroethylene lip seal for use as an O.D. lip seal on a part having an annular groove formed therein and adapted to fit within a bore, said lip seal to seal against unidirectional fluid flow between said part and said bore, comprising a curved, unitary, internally stressed polytetrafluoroethylene frusto-conical shape stretch-formed from a flat annulus having a substantially uniform thickness of at least 0.010 inch but less than the width of the groove into which said lip seal is to sit, an interference between the inside diameter of the seal and the outside diameter of the part to which it is attached of between 0.100 inch and 0.200 inch and an annulus width of at least 0.04 inch greater than the maximum clearance between the bore which it contacts and the bottom of the groove in which the lip seal sits.

3,995,869

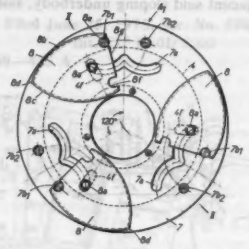
AUTOMATIC CLAMPING DEVICE FOR A CYLINDRICAL PIECE ROTATING ABOUT ITS LONGITUDINAL AXIS

Jean Mazingue, Epernay, France, assignor to Virax, France

Filed June 19, 1975, Ser. No. 588,500
Claims priority, application France, June 24, 1974, 74.22351
Int. Cl.² B23B *31/12*
U.S. Cl. 279—33 **11 Claims**

1. An apparatus for rotating a workpiece, comprising:
   a. a body;
   b. a hollow shaft for receiving the workpiece, said shaft being mounted in said body and rotatable in either direction about an axis of rotation of said shaft; and
   c. at least one automatic clamping means for clamping the workpiece, said clamping means including a chuck plate fixed on said shaft, at least one clamping jaw to contact the workpiece, and means swingingly mounting each said jaw to said chuck plate, said mounting means including first pivot means about which said jaw can swing, and second pivot means for moving said jaw about said first pivot means, said second pivot means including two pivots spaced-apart on and rotatable with said chuck plate,

said clamping jaw having an edge including means engageable with said two pivots for hinging and bearing one



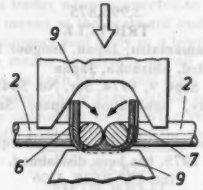
of said two pivots depending on the direction of rotation of said shaft.

3,995,870

PROCESS OF MANUFACTURING WROUGHT-IRON LATTICES

Anton Hulek, Goglerfeldgasse 15, Linz, Austria

Filed Nov. 28, 1975, Ser. No. 635,877
Claims priority, application Austria, Dec. 2, 1974, 9628/74
Int. Cl.² B23K *1/00, 9/00, 11/00, 15/00*
U.S. Cl. 219—58 7 Claims



1. A process of manufacturing wrought-iron lattices, which comprises

placing pre-shaped wrought-iron rods one beside another in a lattice array, in which node-forming portions of adjacent rods are disposed close to each other at a plurality of node positions,

inserting all node-forming portions to each of said node positions into a U-shaped strip metal element having an inwardly protruding longitudinal rib,

joining each of said strip metal elements to said node-forming portions inserted therein by a projection welding operation in which said rib is used as a projection, and

subsequently closing each of said strip metal elements to form a closed clip embracing said node-forming portions joined thereto.

3,995,871

VAPOR RECOVERY OVERTURN RAIL

George F. Vornberger, Cincinnati, Ohio, and John J. Glassmeyer, Glenwood, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed July 22, 1975, Ser. No. 597,934
Int. Cl.² B60P *3/22;* B65D *25/00*
U.S. Cl. 280—5 R 3 Claims

1. A vapor recovery system for a generally horizontally elongated tank trailer,

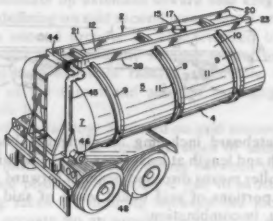
a wheel supported tank body having sides and comprising compartment means for storing vaporizable liquids and having inlet and outlet means,

vent means for venting said compartment means,

vapor-collector conduit means connected to said sides of the tank in strength-imparting relation thereto,

means for conducting vapors from said venting means to said conduit means,

said conduit means comprising guard rails having integrally connected webs forming a vapor leak-proof passageway therethrough,



said rails being of A-section and having side webs with free edges integrally connected to said tank,

said rails comprising top and intermediate webs integrally united with the side webs and forming therewith a plurality of longitudinal passages,

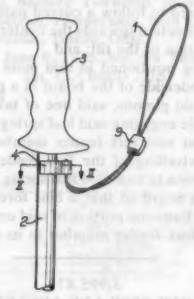
and means for connecting selected vent means to respective passages.

3,995,872

ATTACHMENT

Claude Joseph, 74700 Sallanches, France

Filed Aug. 22, 1975, Ser. No. 606,939
Int. Cl.² A63C *11/22*
U.S. Cl. 280—11.37 H 7 Claims



1. In a ski-pole security attachment comprising a looped leash and means for releasably securing said leash to a ski pole, the improvement wherein said securing means comprises a single piece of resilient material in the form of a generally U or C-shaped clip having a central body portion protruding outwardly of the center of the U or C and two resilient arms extending from said central body portion for gripping about a cylindrical ski-pole over a major part of its circumference; said arms being resiliently distendable for force-fitting of said piece on a ski pole and for allowing release of said piece and said leash from the pole in the event of a force exerted on said piece by said leash greater than a given value, and means for firmly securing said leash to said central body portion of said piece.

3,995,873

SKATEBOARD

Richard Cloutier Pantzar, 400 Orion Way, Newport Beach, Calif. 92660

Filed Nov. 17, 1975, Ser. No. 632,584
Int. Cl.² B62B *3/00*
U.S. Cl. 280—87.04 A **4 Claims**

1. A skateboard including an elongated board having a given width and length at least three times said width and front and rear roller means disposed beneath forward and rearward underside portions of said board, each of said roller means comprising, in combination:

a. a main supporting trunnion frame rigidly secured to the underside of the board and defining spaced coaxial trunnion openings on a journalling axis extending downwardly from the underside of the board and inwardly towards a point space below the center of the board to define an acute angle with the longitudinal axis of the board lying in a vertical plane;

b. a roller;

c. a fork-fender member having a fork portion rotatably supporting said roller and a fender portion covering a portion of the periphery of said roller and including means defining spaced oppositely directed coaxial pinions lying on an axis oriented at right angles to the axis of rotation of said roller and spaced therefrom, said pinions being receivable in and supported by said trunnion openings so that said fork-fender member can swivel about said journalling axis whereby when a skater places more weight on one longitudinal edge portion of the board than the other to tilt the board, each of the fork-fender members are caused to swivel in opposite directions simultaneously from neutral positions to turn the forward roller towards the direction of the tilt and the rearward roller in an opposite direction as viewed in plan to thereby cause the skateboard to follow a curved path, the radius of the curve in a direction towards the center of the curve being in the direction of the tilt; and

d. a leaf spring positioned in said main frame and spaced from the underside of the board in a position juxtaposed to one of said pinions, said one of said pinions having a flattened side engaging said leaf spring when said board is level so that said fork-fender member is in its neutral position, swivelling of the fork-fender member causing said one pinion to cam said leaf spring towards the underside of said board so that a bias force is exerted on an edge of the flattened portion of said one pinion tending to return the fork-fender member to its neutral position.

3,995,874

PIVOTED FRONT STEP AND ANGLED UNDER BODY FOR LOW FLOOR BUS

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 17, 1975, Ser. No. 632,183
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **9 Claims**

1. In a bus having front and rear support wheels, a low body with its forward portion extending a substantial distance forwardly of the front wheels, and a front bumper mounted on said body;

an angled underbody portion sloping upwardly and forwardly toward the front bumper from a transverse line in the zone of the front wheels,

a front entrance in the side of the bus above a selected portion of such sloping underbody, and,

a pivoted step for said front entrance, said step being hingedly mounted at its rear end for limited pivotal movement about an axis extending transversely of the bus closely adjacent said sloping underbody, said step being

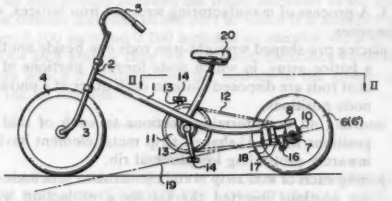
pivotally movable between upswung, stowed position, substantially flush with the sloping underbody portion, and downswung, deployed position, substantially level, and extending downwardly below the sloping underbody portion forwardly of the step axis.

3,995,875

TRICYCLE

Hiroshi Wada, Hamamatsu, Japan, assignor to Suzuki Motor Company Limited, Shizuoka, Japan

Filed Sept. 9, 1974, Ser. No. 504,306
Claims priority, application Japan, Sept. 12, 1973, 48-106944
The portion of the term of this patent subsequent to Apr. 29, 1975, has been disclaimed.
Int. Cl.² B62K *5/06*
U.S. Cl. 280—282 **7 Claims**



1. A tricycle comprising

a main frame,

a single front wheel and supporting means provided at a forward end of said main frame for steerably supporting the front wheel, said front wheel normally contacting the ground at a ground contact point,

two rear wheels and a transversely extending rear frame means, separate from said main frame, for rotatably supporting the two rear wheels on opposite ends thereof,

connecting means provided at a rear end of said main frame for connecting said main frame to said rear frame, said connecting means comprising a boss fixed to said main frame and a connecting shaft affixed to said rear frame and pivotably disposed in said boss such that an extension of the axis of said shaft disposed in said boss passes below said ground contact point of the front wheel and when the plane containing the main frame is perpendicular to the ground and,

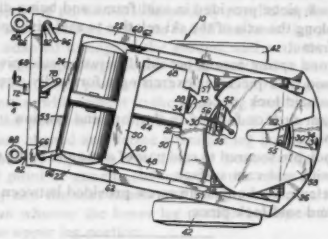
rear wheel driving means for driving one of said rear wheels.

3,995,876

TRAILER DOLLY

R. Mack Ronne, 1244 E. River Forest Lane, Portland, Oreg. 97222

Filed June 25, 1975, Ser. No. 590,308
Int. Cl.² B60D 3/00
U.S. Cl. 280—423 A 3 Claims



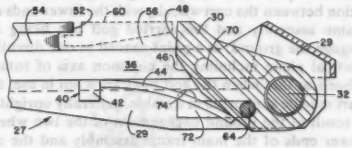
1. A trailer dolly comprising
a. a longitudinal main frame having forward and rearward ends,
b. a conventional fifth wheel on a forward end of said main frame arranged for removable connection to the king pin of a trailer,
c. a caster wheel assembly under the forward end of said main frame providing steerable wheel support of said dolly and a trailer when connected to said fifth wheel,
d. and hitch means at the rearward end of said frame arranged to connect said dolly to a towing vehicle,
e. said hitch means comprising a pair of hitch members located one on each side of said main frame for connection to a towing vehicle at two lateral points whereby said dolly when connected to a towing vehicle comprises a longitudinally rigid extension of the towing vehicle.

3,995,877

FIFTH WHEEL

William P. Albrecht, and Ralph H. Sparks, both of Lancaster, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 22, 1975, Ser. No. 598,504
Int. Cl.² B62D 53/10
U.S. Cl. 280—432 3 Claims



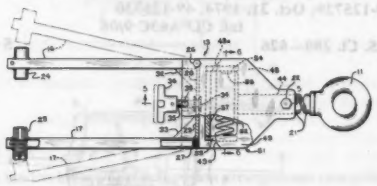
1. In combination with a tractor-trailer rig an improved fifth wheel assembly for coupling the trailer with the tractor of said rig, comprising:
A. a first subassembly including a first wear plate rigidly affixed to the trailer;
B. a king pin projected substantially orthogonally from said first wear plate;
C. a second subassembly including a second wear plate pivotally mounted on said tractor including means defining in the second wear plate a receiver including a throat of a substantially V-shaped configuration having an apex disposed near the center of said second wear plate for receiving said king pin;
D. means mounted on said second wear plate in juxtaposition with the apex of said throat for capturing said king pin;
E. safety means responsive to motion imparted to said first wear plate, relative to said second wear plate, in opposed directions substantially paralleling the longitudinal axis of symmetry of said tractor for coupling the first wear plate to the second wear plate including,
an arcuate body rigidly affixed to said first wear plate in concentric relation with said king pin and including a first arcuate lip extended toward said king pin, and
means defining on said second wear plate a crown including a second arcuate lip characterized by a pair of segments concentrically related to the apex of said throat and extended radially therefrom at opposite sides of the throat and adapted to engage said first arcuate lip;
F. a pair of pivotal dogs mounted on said second subassembly and supported at opposite sides of said throat for pivotal motion in vertical planes between elevated and depressed positions, including a pair of substantially upstanding faces for defining between the faces and the second arcuate lip an arcuate receiver for said arcuate body;
G. means including a pair of springs for supporting said pair of dogs in said first position;
H. means including a pair of pivotal arms connected with said pair of dogs adapted to be manipulated for imparting pivotal motion to said dogs for displacing the dogs against said torsion springs from said elevated position to said depressed position; and
I. means for releasibly securing said pair of dogs against pivotal displacement from said depressed position.

3,995,878

AIRCRAFT TOWBAR

Wayne A. Geraci, Bedford Township, Monroe County, and William C. Stoneman, Temperance, both of Mich., assignors to Dana Corporation, Toledo, Ohio

Filed June 9, 1975, Ser. No. 585,337
Int. Cl.² B60D 1/16
U.S. Cl. 280—488 8 Claims

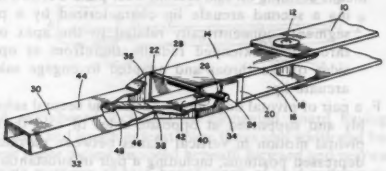


5. An aircraft towbar comprising, a forward elongate section having means for connection to a towing vehicle, a rearward section pivotally mounted to said forward elongate section, said rearward section having means for connection to an aircraft nosewheel, said forward elongate section including a generally C-shaped yoke, said C-shaped yoke having opposed legs, a compression spring mounted on said rearward section, said spring being mounted generally horizontal and normal to said rearward section, said spring having ends in position for engagement by said legs of said C-shaped yoke, whereby when said forward section is pivoted relative to said rearward section, a leg of said C-shaped yoke compresses said spring urging said forward elongate section toward a position parallel and colinear with said rearward section.

3,995,879
WAGON TONGUE CONSTRUCTION

Kenneth M. Coldren, Fort Wayne, Ind., assignor to M & W Gear Company, Gibson City, Ill.

Filed July 30, 1975, Ser. No. 600,204
Int. Cl.² B60D 1/16
U.S. Cl. 280—489 3 Claims

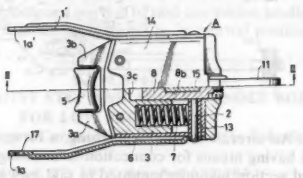


1. A tongue support device comprising in combination:
a first tongue member attached to a vehicle and projecting therefrom, said first tongue member defining an open ended enclosure with a bottom inside surface;
a substantially horizontal axis through said first tongue member at the open end and above the bottom inside surface of the enclosure;
a second tongue member including opposed spaced vertical plate members projecting over the first tongue members and pivotally connected thereto at the horizontal axis, said second tongue member also including an open ended enclosure in opposed relation with the open ended enclosure of the first tongue member, said open ended enclosure of said second tongue member including a top inside surface;
and a cantilever, leaf spring means rigidly attached to said first tongue member at the bottom inside surface below the horizontal axis, projecting in sliding engagement with the top inside surface of said second tongue member to bias said second tongue member against the force of gravity about the axis of interconnection between said members.

3,995,880
HEEL PIECE OF A SKI SAFETY BINDING

Masahiro Murata, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1975, Ser. No. 627,797
Claims priority, application Japan, Oct. 31, 1974, 49-125729; Oct. 31, 1974, 49-125730
Int. Cl.² A63C 9/08
U.S. Cl. 280—626 5 Claims



1. A heel piece of a ski safety binding comprising:
a base plate attached fixedly to a ski;
heel piece mounting means supported on said base plate and being slidable along the axis of the ski;
a pair of arm pivotally connected to said heel piece mounting means;
a pivot pin provided between the free end portions of said pair of arms and extending horizontally across the axis of the ski;
a frame pivotally connected to said pivot pin and being displaceable along the axis of the ski relative to said pivot pin;
a heel holding member fixedly secured to said frame and adapted for fitting with the heel of a ski boot at the front end thereof;
first spring means provided between said pivot pin and said frame for exercising a forwardly directed force to said frame;
a lock piece provided in said frame and being displaceable along the axis of the ski relative to said pivot pin and said frame;
second spring means provided between said pivot pin and said lock piece for exercising a forwardly directed force to said lock piece;
a cam surface formed in the fore end portion of said lock piece;
a lock pin secured to said pair of arms and being engageable with said cam surface; and
a release load adjusting screw provided between said frame and said lock piece.

3,995,881
GOLF CART SEAT ASSEMBLY

George M. Kruchell, 10340 Chaucer St., Westchester, Ill. 60153

Filed Aug. 8, 1975, Ser. No. 603,049
Int. Cl.² A63B 55/08
U.S. Cl. 280—646 9 Claims

1. An improved foldable seat assembly for a golf bag cart that includes a pair of laterally spaced, ground engaging wheels mounted for rotation about a common axis of rotation, and a main frame assembly that is mounted on the wheels and that is adapted to carry a golf bag in a generally vertical disposition between the cart wheels, with the lower ends of the main frame assembly and the carried golf bag being adapted to engage the ground, at a point spaced in one direction, from a vertical plane including the common axis of rotation of the wheels so that when the golf bag cart is not in use, the golf bag cart may be supported in a stable, generally upright position as a result of the ground engagement of the two wheels and the lower ends of the main frame assembly and the carried golf bag, the improved seat comprising:
a seat frame attached to the main frame assembly at a preselected point adjacent to one side portion of the carried golf bag and generally projected from the main frame assembly in said one direction and so as to extend about the carried golf bag, with the seat frame means having a first position disposed adjacent to a second side portion of the carried golf bag that is opposite to the one side portion of the carried golf bag and with the seat frame being attached to the main frame assembly so that the seat frame is disposed in a generally horizontal plane when the golf bag cart is supported in its stable, generally upright position;
a generally flat seat member attached to the firt portion of the seat frame and being selectively movable between a generally horizontal position and a generally vertical position;

means for supporting the seat member having an upper leg portion and a lower leg portion, with one end of the upper leg portion being attached to the seat member at a point spaced from the point of attachment between the seat member and the first portion of the seat frame and being selectively movable between a first position wherein the upper leg portion is substantially perpendicular to the plane of the seat member and a second position wherein the upper leg portion is substantially parallel to the plane of the seat member; with one end of the lower leg portion being adapted to engage the ground, and with the other end of the upper leg portion being attached to the other end of the lower portion such that the lower leg portion may move, with respect to the upper leg portion, from an unfolded position wherein the upper and lower leg portions are aligned and define a straight leg having a length substantially equal to the distance between the preselected point of attachment between the main frame assembly and the seat frame and the ground and a folded position wherein the lower leg portion is disposed adjacent to upper leg portion;

means for latching the upper and lower leg portions in their unfolded position;

first means for retaining the upper and lower leg portions in their folded position;

second means for retaining the upper leg portion in its second position;

said lower leg portion including a transverse, ground engaging member having upwardly extending leg members formed at each end thereof;

a pair of spaced, depending flanges being secured to the undersurface of the seat member;

said upper leg portion including a generally U-shaped member whose ends are pivotably attached to the pair of flanges; and

the distal ends of the leg members of the lower leg portion being pivotably attached to the closed end of the U-shaped member.

3,995,882

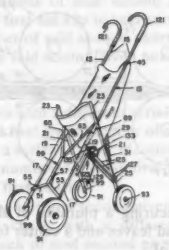
FOLDING SUPPORT STRUCTURE

Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 568,164, April 14, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 640,198

Int. Cl.² B62B *11/00*

U.S. Cl. 280—649 **26 Claims**



1. A folding support structure, comprising:

a pair of rigid elongated frame tubes each having upper, lower and intermediate portions and defining a first plane therebetween;

a pair of rigid elongated seat tubes each having lower and attachment portions and defining a second plane therebetween intersecting said first plane along a movable line perpendicular to the longitudinal axes of said frame and seat tubes in said intermediate and attachment portions thereof;

a rear X brace having a pair of pivotally interconnected rigid rear brace members defining a third plane therebetween, said rear brace members being foldable in said third plane, the lower ends of said rear brace members being pivotally attached to a different one of said seat tubes at said lower portions and the upper ends thereof being pivotally attached to a different one of said frame tubes at said upper portions, the pivotal interconnections at said ends of said rear brace members being of the two-axis type one axis of which being perpendicular to said third plane and the other axis of which being orthogonal thereto and in the plane of the respective tubes to which said interconnections are attached;

a front X brace having a pair of pivotally interconnected rigid front brace members defining a fourth plane therebetween, said front brace members being foldable in said fourth plane, the lower ends of said front brace members being pivotally attached to a different one of said frame tubes at said lower portions; and

folding means associated with the upper ends of said front brace members and with said intermediate portions of said frame tubes and attachment portions of said seat tubes for simultaneously causing an upward movement of said movable line in said first plane, a lessening of the angle between the lower portions of said first and second planes, and a lessening of the distance between respective ones of said frame tubes and between respective ones of said seat tubes when said support structure is moved from its open to closed configuration.

3,995,883

LAND VEHICLE WHEEL SUSPENSION ARRANGEMENTS

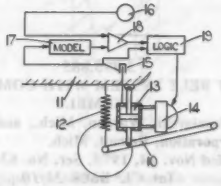
Stanley George Glaze, Brierley Hill, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Aug. 26, 1974, Ser. No. 500,577

Claims priority, application United Kingdom, Nov. 21, 1973, 54259/73

Int. Cl.² B60G *11/26*

U.S. Cl. 280—707 **5 Claims**



1. A land vehicle wheel suspension arrangement comprising a wheel carrier movably mounted on the vehicle body, spring means acting between said carrier and the body, an hydraulic damping device between the carrier and the body for absorbing forces appearing in said spring means and having adjustable force absorbing and acceleration controlling properties, a displacement transducer arranged to produce a first signal corresponding to the position of the wheel carrier relative to the body, and an acceleration transducer on the vehicle body for producing a second signal corresponding to the vertical component of the acceleration of the body adjacent the wheel, and a control device operable to vary the force absorbing properties of the damping device in accordance with a combination of said first and second signals so as to cause the acceleration of said body to be dependent on the position of said wheel carrier relative to said body.

3,995,884

PASSIVE SAFETY DEVICE FOR VEHICLES

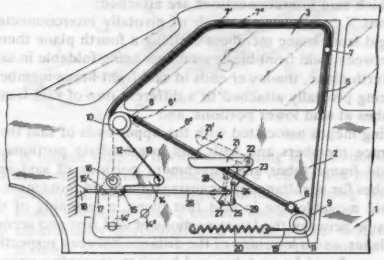
Andreas Bauer, and Erwin Blüggel, both of Fallersleben, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 26, 1975, Ser. No. 635,391

Claims priority, application Germany, Dec. 11, 1974, 2458549

Int. Cl.² B60R 21/02

U.S. Cl. 280—745 8 Claims



1. An improved passive safety device for a vehicle, such as an automobile, having at least one safety belt anchor point movably maintained in a guide extending substantially diagonally over a door panel and driving means for moving the anchor point in the guide such that the anchor point will assume a restraining position in which a safety belt associated therewith is applied about the body of a vehicle occupant when the door is closed and will assume a releasing position in which the safety belt is lifted from the vehicle occupant when the door is open, wherein the improvement comprises an arm rest movably mounted on the door and moving means operatively connecting the arm rest to the driving means for selectively moving said arm rest between first and second positions such that, upon operation of the driving means, the arm rest is moved in conjunction with movement of the safety belt anchor point, between the first position in which the arm rest is substantially horizontal with respect to the door when the anchor point is in its restraining position and the second position in which it does not hinder movement of the anchor point in the guide when the anchor point is moved to its releasing position.

3,995,885

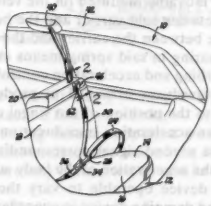
RESTRAINT BELT SYSTEM WITH COMFORT CLAMP ASSEMBLY

Edward J. Plesniarski, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,856

Int. Cl.² B60R 21/10

U.S. Cl. 280—747 3 Claims



1. In a vehicle body including an occupant seat having cushion and back portions, a restraint belt system for a seated occupant comprising: a shoulder belt extending generally diagonally across the chest of the seat occupant while in the restraining position, the shoulder belt having a lower end engageable with the vehicle body and an upper end extending over the shoulder of the seat occupant, a retractor mounted on the vehicle body and receiving the upper end of the shoulder belt so as to normally tension the shoulder belt across the chest of the seat occupant and retract the shoulder belt to a stored position upon disengagement of the lower end of the belt from the vehicle body, guide means located on the vehicle body toward the retractor with respect to the shoulder of the seat occupant and slidably receiving the shoulder belt to locate the shoulder belt with respect to the occupant, the guide means allowing the shoulder belt to be freely pulled in either direction therethrough so that movement of the shoulder belt is not impeded and the retractor tensions the shoulder belt across the chest of the seat occupant, clamp means adapted to clamp the belt against movement through the guide member to thereby prevent the shoulder belt retractor from tensioning the shoulder belt across the occupant's chest, said clamp means having a clamp lever adapted to engage the shoulder belt, means pivotally mounting the clamp lever for pivotal movement between a belt clamping position and an unclamping position, spring means acting on the clamp lever and going overcenter upon pivotal movement of the clamp lever between the belt clamping position and the unclamping position so that the tension of the spring means maintains the clamp lever at its then existing position, the spring means holding the clamp lever in the belt clamping position with a force sufficient to clamp the belt with sufficient force to prevent the shoulder belt retractor from retracting the shoulder belt through the guide member, the clamp lever being arranged with respect to the shoulder of the occupant so that forward leaning movement of the shoulder of the occupant causes the belt to move the clamp lever from one of the positions to the other position.

3,995,886

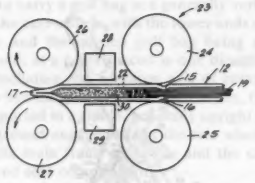
HEAT REACTIVATIBLE ADHESIVE BOOK BINDING

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Aug. 14, 1975, Ser. No. 604,659

Int. Cl.² B42D 1/00

U.S. Cl. 281—21 R 6 Claims



1. A method of securing a plurality of sheets to a cover having first and second leaves and a center fold therebetween comprising the steps of:

a. applying a strip of heat reactivatible adhesive to one of the leaves adjacent, but not in contact with the center fold;

b. positioning the ends of a plurality of paper sheets adjacent the strip of heat reactivatible adhesive;

c. folding the leaves together with the paper sheets therebetween;

d. heating the cover adjacent the heat reactivatible adhesive to melt said adhesive; and

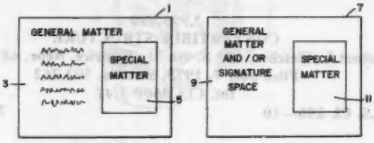
e. compressing the cover at the center fold to force the melted adhesive to flow into contact with the other leaf and around the edges of the plurality of sheets.

3,995,887

METHOD AND SYSTEM FOR CONTROL OF MULTIPLE INVENTORIES

Brock F. Brockway, Mill Valley, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed Apr. 7, 1975, Ser. No. 565,347
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—55 2 Claims



1. A system for monitoring the contents of a plurality of first aid kits, a first given number of which have different desired contents from a second given number thereof comprising the steps of:

a. printing a quantity of first charts which is many times greater than said plurality of first aid kits, each of said first charts having first and second regions thereon, said first region thereof carrying first printed matter common to all of said first charts and said second region thereof being blank;

b. printing a quantity of second charts which is many times greater than said plurality of first aid kits, each of said second charts having first and second regions thereon, said first region thereof carrying second printed matter common to all of said second charts and said second region thereof being blank;

c. printing a list of the desired contents of said first given number of first aid kits in said second region of a first given number of said first charts which is many times greater than said first given number of said plurality of first aid kits and printing a list of the desired contents of said second given number of first aid kits in said second region of a second given number of said first charts which is many times greater than said second given number of said plurality of first aid kits;

d. printing said list of the desired contents of said first given number of said plurality of first aid kits in said second region of a first given number of said second charts which is many times greater than said second given number of said plurality of first aid kits and printing said list of the desired contents of said second given number of said plurality of first aid kits in said second region of a second given number of said second charts which is many times greater than said second given number of said plurality of first aid kits;

e. providing each of said first given number of said quantity of first charts with a different serial number and providing each of said first given number of said quantity of second charts with a serial number identical to a different one of said serial numbers of said first given number of said quantity of first charts;

f. providing each of said second given number of said quantity of first charts with a different serial number and providing each of said second given number of said second charts with a serial number identical to a different one of said serial numbers of said second given number of said quantity of first charts;

g. periodically transporting to one of said first given number of first aid kits one of said first given number of said quantity of first charts and one of said first given number of said quantity of second charts bearing identical serial numbers, comparing the contents of said one of said first given number of first aid kits to said list of desired contents thereof in said second regions of said ones of said first given numbers of said quantities of first and second charts, marking said ones of said first given numbers of said quantities of first and second charts to indicate items missing from said one of said first given number of first aid kits, signing, dating and filing said one of said first given number of said quantity of first charts in a central file, placing said one of said first given number of said quantity of second charts in said one of said first given number of first aid kits; and

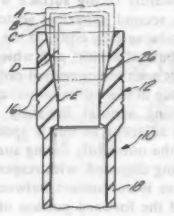
h. periodically transporting to one of said second given number of first aid kits one of said second given number of said quantity of first charts and one of said second given number of said quantity of second charts bearing identical serial numbers, comparing the contents of said one of said second given number of first aid kits to said list of contents thereof in said second regions of said ones of said second given numbers of said quantities of first and second charts, marking said ones of said second given numbers of said quantities of first and second charts to indicate items missing from said one of said second given number of first aid kits, signing, dating and filing said one of said second given number of said first charts in a central file, placing said one of said second given number of said quantity of second charts in said one of said second given number of first aid kits.

3,995,888

FLEXIBLE PIPE CONNECTOR

John C. McIlroy, 906 Baldwin, Lapeer, Mich. 48446

Continuation-in-part of Ser. No. 358,996, May 10, 1973, Pat. No. 3,908,208. This application Apr. 21, 1975, Ser. No. 570,159
Int. Cl.[2] F16L *25/00*, *43/00*
U.S. Cl. 285—4 4 Claims



1. A flexible pipe connector for use in coupling a pair of transaxial pipes, comprising:

an arcuately curved pipe bend portion having a pair of end portions, each sized to receive a different one of the pair of pipes;

each of said end portions having a plurality of segmented and frangible end section each of like outside diameter;

a pair of clamps, each engageable over different ones of said segmented end sections for attaching each respective end portion about its opposed pipe; and

a threaded fastener engageable with opposed extending lips from each of said clamps for tightening each clamp about the associated segmented end portion and for thus holding the bend portion tightly attached to the pipes;

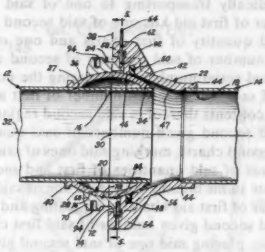
said end portions further having a tapered internal diameter extending inwardly over a length of said end portion substantially equal to the combined length of the segmented end sections.

3,995,889

DREDGE FLOATING PONTOON PIPE-LINE JOINT

John S. Carr, Palos Park, and George Pelton, Chicago, both of Ill., assignors to Hydro-Dredge Accessory Co., Rosemont, Ill.

Filed May 22, 1975, Ser. No. 579,863
Int. Cl.² F16L 27/06
U.S. Cl. 285—91 11 Claims



1. In a dredge pontoon line, an improved ball joint adapted to releasably connect adjacent ends of two conduit sections in the dredge pontoon line utilized to convey sand and sediment in suspension during dredging operations, the improved ball joint comprising:

a ball member adapted to be secured to the end of one of the conduit sections, the ball member having an opening therethrough coaxial with the longitudinal central axis of the one conduit section and having an annular, outwardly facing surface formed in the shape of a first spherical sector, with the center of the first spherical sector lying on the central longitudinal axis of the one conduit and with the outwardly facing surface of the ball member being divided, by an imaginary transverse plane that includes the center of the first spherical sector and that is perpendicular to the longitudinal central axis, into a forward portion that faces toward the other conduit and rearward portion that faces away from the other conduit;

a ring mounted on the ball member and including first and second annular sections, a first annular section having an annular, inwardly facing surface which is formed in the shape of a second spherical sector having a radius of curvature substantially equal to the radius of curvature of the first spherical sector, and which is in surface to surface contact with the rearward portion of the outwardly facing surface of the ball member, and the second annular section having annular inwardly facing surface which overlies, is adjacent to but is spaced from the forward portion of the outwardly facing surface of the ball member and being disposed, with respect to the ball member, so that there is no contact between the second annular section and the forward portion of the outwardly facing surface of the ball member;

means carried by the second annular section of the ring for retaining the inwardly facing surface of the first annular section of the ring in surface to surface contact with the rearward portion of the outwardly facing surface of the ball member while permitting relative, universal, surface to surface movement between the inwardly facing surface of the first annular section of the ring and the rearward portion of the outwardly facing surface of the ball member, the retaining means including a plurality of retaining pins carried by the second annular section of the ring at spaced intervals about the second annular section of the ring, with one end of each of the retaining pins being secured to the second annular section, and with the other end of each of the retaining pins being in contact with the forward portion of the outwardly facing surface of the ball member;

a socket member having a first end adapted to be secured to the end of the other conduit section and a second end adapted to fit about at least a portion of the outwardly facing surface of the ball member; and

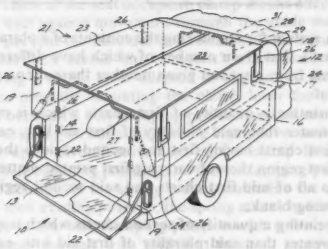
means for selectively locking the ring and the socket member.

3,995,890

CONVERTIBLE STRUCTURE

Robert L. Fletcher, 623 S. 9th St., Beatrice, Nebr. 68310

Filed July 7, 1975, Ser. No. 593,362
Int. Cl.² B60P 3/42
U.S. Cl. 296—10 7 Claims



1. A convertible structure comprising:

a floor;

a pair of spaced upstanding side walls secured to said floor;

a front end wall secured to said floor and to said side walls;

a pair of spaced rear end walls, each said rear end wall secured to said floor and to one of said side walls;

a pair of roof panels movable from a closed position to an open position, said roof panels extending between said side walls in longitudinal edge to longitudinal edge position over said floor when disposed in said closed position and each roof panel vertically disposed adjacent its respective side wall when in said open condition;

hinge means hingedly interconnected between each said roof panel and its respective side wall; and

L-shaped control arms, each control arm having a base leg connected on one end to one end of a second leg with the free end of said base leg pivotally connected to one of said end panels and with the free end of said second leg pivotally connected to one of said roof panels adjacent thereto, and said second leg having a bend formed therein which is operable to seat on the upper edge of said side wall when said roof panel is disposed in said open position.

3,995,891

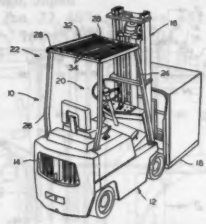
DRIVER'S OVERHEAD GUARD

Deryl R. Hoyt, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 1, 1975, Ser. No. 636,501
Int. Cl.² B60R 21/00
U.S. Cl. 296—102 15 Claims

1. In an industrial vehicle having an overhead guard of generally inverted U-shaped construction which extends over an operator's compartment, a bridge structure connecting the legs of said guard comprising a pair of spaced multi-sided hollow structural members having inner sides confronting, a plurality of openings in one inner side spaced longitudinally thereof and substantially aligned with similar openings in the

other inner side, a guard bar extending through each confronting pair of openings and into the interiors of both hollow



structural members in such a manner as to provide a plurality of restrained beams when said beams deflect under load.

3,995,892

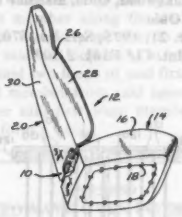
SEAT COVER FASTENING SYSTEM

Richard F. Hellman, Milwaukee, and Garth O. Hall, New Berlin, both of Wis., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,121

Int. Cl.² A47C *27/00*

U.S. Cl. 297—219 **8 Claims**



1. In a seat member having a compressible cushion portion and an upholstery portion surrounding said compressible cushion portion, the improvement comprising stiff longitudinal retaining portions affixed to the opposite ends of said upholstery portion, said upholstery portion being of such a length that said cushion portion will be at least partially compressed when said opposite ends are in overlying relationship with each other, said cushion portion being recessed in the vicinity of said opposite ends, and a generally tubular member being located in said recess, said tubular member having an outwardly facing longitudinal slot, said overlying opposite ends and said retaining portions being positioned within said tubular member so that an edge of each of said retaining portions is in contact with the inner wall of said tubular member at a location closely adjacent to said longitudinal slot, said retaining portions preventing the removal of said opposite ends from said longituudinal slot.

3,995,893

CUSHION COMPRISING A SQUAB INCLUDING AT LEAST TWO PARTS CONNECTED BACK TO BACK

Olivier P. De La Taille; Jean Francois Labadie, and Armand R. Bernard, all of Etampes, France, assignors to Etablissements Bertrand Faure, Le Chesnay, France

Filed June 10, 1975, Ser. No. 585,599

Claims priority, application France, June 14, 1974, 74.20793

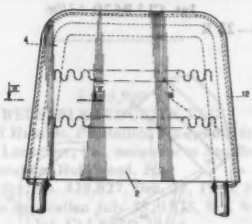
Int. Cl.² A47C *5/06*

U.S. Cl. 297—452 **2 Claims**

1. A cushion comprising:

a squab including at least two cooperating body parts each having a face and a back, wherein the two body parts are connected back-to-back and together define therebetween a cavity,

a first one of said two body parts of the squab is made of a semi-rigid material, is provided with a cover on its face, and has a rim portion extending around the periphery thereof, while the second one of said two body parts of said squab is made of a resilient material, is provided with a cover on its face, and has a recess portion extending



around the periphery thereof within which said peripheral rim of said first squab part is seated,

a supporting frame disposed within said cavity and surrounded by said assembled body parts,

said rim portion is provided with an outer peripheral channel disposed substantially in the plane of the frame, and

a resilient wire disposed in said channel for holding in said channel the periphery of said cover covering the face of the second body part of the squab and thereby holding the two parts of the squab firmly against each other.

3,995,894

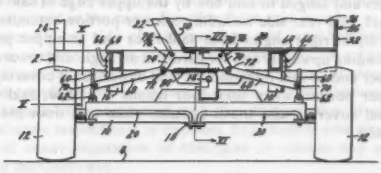
LATERAL STABILIZER FOR DUMP TRUCKS

Jerald W. Bishop, Osborne, Kans., assignor to Gilmore-Tatge Manufacturing Co., Inc., Clay Center, Kans.

Filed Nov. 17, 1975, Ser. No. 632,212

Int. Cl.² B60P *1/16*

U.S. Cl. 298—10 **5 Claims**

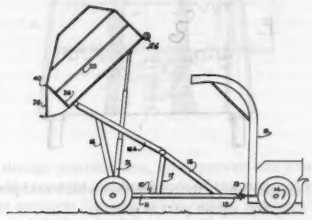


1. In combination with a dump truck including a dump bucket carried by a truck bed, and pivoted along one of its upper side edges to said bed for movement from a normal upright position generally centered over said bed to a generally inverted dump position to dump its contents at one side of said bed, said bed being supported by ground-engaging wheels carried rotatably at the opposite ends of each of one or more transversely extending axle bars, and being transversely tiltable with respect to at least one of said axle bars, a lateral stabilizer comprising:

a. a locking device associated with each of the axle bars relative to which said bed is tiltable and operable when engaged to secure said bed against tilting toward the side of the bucket at which the contents of the bed are dumped, said locking device comprising a pawl and a ratchet carried respectively by said axle bar and said bed, said pawl being pivoted to said axle bar for movement between an engaged position against said ratchet and a disengaged position spaced apart from said ratchet, and

b. control means operable selectively to engage and disengage said pawl.

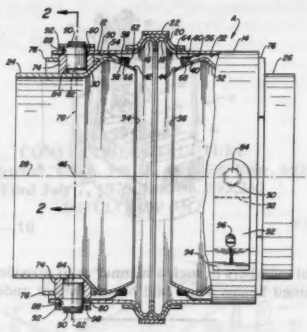
3,995,895
FORAGE BOX
Martin Wedman, General Delivery, New Fish Creek, Alberta, Canada T0H 2S0
Filed Feb. 3, 1975, Ser. No. 546,603
Int. Cl.² B62D *63/06*
U.S. Cl. 298—22 R **8 Claims**



1. A forage box for attachment to harvesting machines and the like comprising in combination a base frame, ground engaging wheels supporting said frame at the rear thereof, hitch means on the front of said frame for attachment to the harvesting machine and the like, and a forage box, said box including a floor, a pair of sides, a front side and a rear side, means to pivotally mount said box upon said frame for pivotal motion of said box in a vertical plane, hydraulic piston and cylinder means operatively connected between said frame and said box for said pivotal action, said box having an open intake adjacent to said front side thereof and an open discharge on the said rear side thereof, and door means hinged to said box to close said discharge when said box is in the lowermost position and to open said discharge when said box is in the elevated position, said door means including a pair of panels, an upper panel and a lower panel, hinged together by adjacent edges and hinged to said box by the upper edge of said upper panel, said rear side including a lower portion extending upwardly at right angles from said floor and an upper portion extending upwardly and forwardly at an angle and towards the upper end of said open intake, said upper panel covering said upper portion when said door means is closed, said lower panel covering said lower portion when said door means is closed.

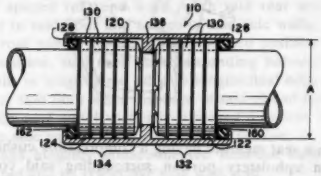
3,995,896
FLEXIBLE JOINT FOR CONDUIT
Maurice S. Decker, Columbus, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Dec. 18, 1974, Ser. No. 533,883
Int. Cl.² F16L *21/00*
U.S. Cl. 285—233 **18 Claims**

1. A flexible joint for conduit comprising; a joining member, conduit members each having a longitudinal axis and including a conduit end portion received in said joining member, one of said members having a generally spherical surface portion facing generally toward the other of said members and lying generally on the surface of a sphere having a sphere center located on said longitudinal axis, opposite pivotal connecting means pivotally connecting said joining member and conduit member on a pivot axis which intersects said sphere center, peripheral sealing means on said other member sealingly engaging said spherical surface portion, and said pivotal connecting means including selective adjustment means for moving said members relative to one another parallel to said longitudinal axis and moving said spherical surface portion and said



sealing means toward and away from one another while maintaining said pivot axis in intersection with said sphere center.

3,995,897
COUPLING
Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Filed Apr. 21, 1975, Ser. No. 570,043
Int. Cl.² F16L *21/00*
U.S. Cl. 285—340 **9 Claims**



1. A pipe coupling for connecting the end of a section of pipe to a member such as another section of pipe or the like, said coupling comprising:

a housing member having a bore therein, said bore having a diameter of larger dimension than the exterior diameter of the section of pipe to be coupled; and

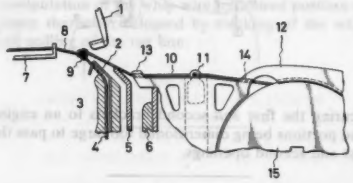
a plurality of substantially identical, one-piece, stamped spring steel, pipe end receiving and retaining fasteners received and retained in said bore, each of said fasteners having a radially outer flange for contact with the wall of said bore, said fasteners having a radially inwardly extending portion which terminates at an annular edge, said annular edge defining an aperture of somewhat smaller diameter than the exterior diameter of said pipe to be coupled, said radially inwardly extending portion being radially serrated to define a plurality of spring fingers, said spring fingers being inclined with respect to a plane normal to said bore and passing thru the juncture of said flange and said portion, said fasteners being arranged within said bore such that said spring fingers are inclined away from the end of the bore from which the section of pipe is to be inserted, and said flanges extending substantially normally to said plane passing thru the juncture of said flange and said portion in the direction opposite the direction that said spring fingers extend from said plane, the edge of flange most distant said plane being radially outwardly flaired to define a cross-section of greater dimension than the cross-section of said bore.

3,995,898

METHOD FOR MANUFACTURING FISHING NET

Atsushi Momoi, Akaho, Japan, assignor to Momoi Fishing Net Mfg., Ltd., Hyogo, Japan

Filed Jan. 22, 1976, Ser. No. 651,404
Int. Cl.² B65H 69/04
U.S. Cl. 289—1.5 6 Claims



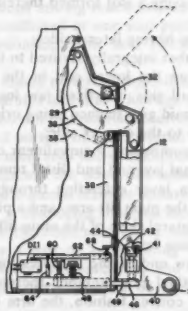
1. A method of manufacturing a fishing net including knots formed of a first warp member and a second weft member which comprises the following steps: holding either of the first and second members by an upper hook, said hook being freely rotatable about its own axis; moving the other of said first and second members into a position adjacent said upper hook; rotating said upper hook about its axis a half rotation or one and a half rotations to catch the other of said first and second members; rotating said upper hook about its axis a full rotation to form two loops from the first and second members; pulling the first warp member through said two loops and passing said first member along the underside of a shuttle frame, causing the first warp member to draw the second seft member through said two loops so as to bend it within said two loops; releasing said two loops of said first warp member and said second weft member from said upper hook; and tightly fastening together said first warp member and said second weft member to form a knot.

3,995,899

MICROWAVE OVEN INTERLOCK

Coy M. Tippy, and David F. Graff, both of New Iberia, La., assignors to Hobart Corporation, Troy, Ohio

Filed Feb. 14, 1975, Ser. No. 549,964
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² E05C 3/30
U.S. Cl. 292—254 11 Claims



1. A microwave oven interlock for preventing oven operation when the oven door is open or unlatched comprising:

a cabinet with a front opening,

a door covering said opening and hinged to said cabinet to move between a closed position covering said opening and an open position permitting access into the oven,

strike means movably mounted on said cabinet for latching said oven door in its closed position with said strike means in a first position,

disengagement means in said oven door for moving said strike means to a second position allowing said oven door to open,

position sensing means for sensing the position of said oven door, and

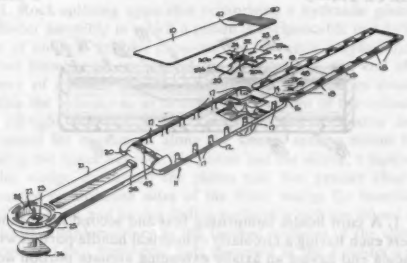
means, reponsive to said strike means moving to said second position, or to said position sensing means indicating that said oven door is not in said closed position, arranged to prevent operation of the oven.

3,995,900

REUSABLE SECURITY TAG

David Raymond Humble, Plantation, Fla., and Harry Godfrey Walters, III, Lancaster, Pa., assignors to Sensormatic Electronics Corporation, Hollywood, Fla.

Division of Ser. No. 428,827, Dec. 27, 1973, Pat. No. 3,943,829. This application July 25, 1975, Ser. No. 599,080
Int. Cl.² B65D 33/34
U.S. Cl. 292—316 3 Claims



1. A clutch lock comprising a cruciate member of spring sheet metal with one pair of arms at right angle to another pair of arms and with a pair of jaws within the central region of said member raised in the same direction from said member so as to project on one side of said member, said jaws being disposed to oppose one another on opposite sides of a plane which is normal to the axis of said one pair of arms for receiving and gripping a pin when one is introduced therebetween, and said jaws are constructed such that manipulation of said pairs of arms respectively in opposite directions in one direction will cause separation of said jaws to release any pin gripped therebetween.

3,995,901

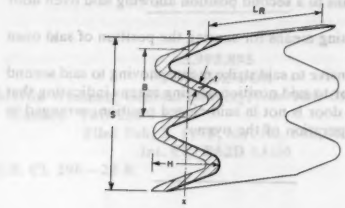
ENERGY-ABSORBING SYSTEMS

William C. Filbert, Jr.; Robert D. Souffie, both of Wilmington, Del., and Richard M. Turner, Wallingford, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 482,790, June 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 383,251, July 27, 1973, abandoned. This application May 20, 1975, Ser. No. 579,150
Int. Cl.² B60R 19/06
U.S. Cl. 293—88 12 Claims

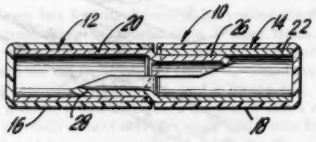
1. An energy-absorbing member formed of an elastomeric composition having a tangent modulus of elasticity at 20°C. of about 3,000–60,000 psi and shaped into at least one sinuous rib, the span of the rib being at least one and one-half full periods as determined along the axis passing half-way between

the crests on opposite sides of the curve, and its length being at least five times but not more than one hundred times its



thickness; said rib being capable of buckling under the force component of impact in the direction of its length.

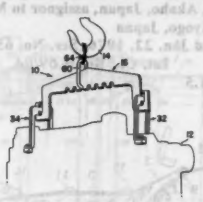
3,995,902
CORN HOLDER CONSTRUCTION
Bartolo Sciaino, Jr., 60 Albion St., Passaic, N.J. 07508
Filed May 1, 1975, Ser. No. 573,405
Int. Cl.² A46G 21/00
U.S. Cl. 294—5 8 Claims



1. A corn holder comprising first and second holder members each having a circularly cylindrical handle portion with a facing end having an axially extending arcuate portion defining a corn piercing tine offset radially inwardly and projecting axially outwardly from said facing end and having a corn engaging pointed end, said holder members each defining a cylindrical receiving cavity extending inwardly from said facing end of a size to accommodate the corn piercing tine of the other member for telescopic interengagement therewith, the facing ends of said first and second holders being disposable in a substantially abutting position when said first and second holder members are interengaged, and being disposed in an interengaged position the arcuate portions which define the tines being disposed in diametrically opposite positions and extending in respective opposite axial directions into the associated cylindrical handle portion offset radially from the tine of the other handle portion.

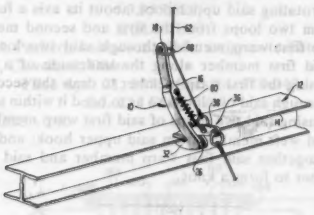
3,995,903
ENGINE LIFT TOOL
James Edward Ernst, Bellevue, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Aug. 18, 1975, Ser. No. 605,470
Int. Cl.² B66C 1/10
U.S. Cl. 294—81 R 4 Claims

1. An engine lift tool, comprising: an elongate yoke member having opposite first and second end portions respectively defining first and second extending transversely to the length of the yoke member; first and second inverted U-shaped lift brackets having respective bight portions respectively shiftably mounted in said first and second openings; said first and second lift brackets being dimensioned suct that it is impossible to remove them from said first and second holes; each of said first and second lift brackets including first and second legs respectively having end portions which are generally horizontally disposed when the first and second openings are located substantially at the same level; and said end portions being provided with vertical apertures for receiving fasteners



for securing the first and second brackets to an engine and said end portions being dimensioned too large to pass through the first and second openings.

3,995,904
CLAMP
Joseph E. Matthews, 4017 N. Witchduck, Virginia Beach, Va. 23455
Filed June 24, 1975, Ser. No. 589,840
Int. Cl.² B66C 1/44
U.S. Cl. 294—104 5 Claims



1. A lift clamp for handling of objects such as I beams which have at least one projecting ledge, the lift clamp comprising:
an elongated main lift arm having an upper end and a lower end;
the main lift arm being longitudinally curved, and being of increased width throughout its lower end;
the main lift arm having forward and rear sides and being curved in such manner that it is concave on its rear side and convex on its forward side;
the lower end having a slot formed therein extending from side to side;
the main lift arm having lateral sides;
a fixed jaw member integrally secured to the lower end and projecting from the lower end in the direction of the convex forward side, the fixed jaw including a toothed grip surface, said grip surface being oriented at an acute angle relative to the convex side;
a movable jaw comprising a curvalinear compression lever with a proximal jaw end and distal remote end;
the compression lever extending through the slot in the lower end of the main lift arm, and a pivot pin extending through the lateral sides of the main lift arm and through the compression lever;
the proximal jaw end of the compression lever having an enlarged toothed jaw member thereon with the teeth projecting in convex fashion, the arm being pivotal to a position whereat the toothed jaw member is closely adjacent the teeth of the fixed jaw;
a first shackle of loop form pivotally secured to the upper end of the main lift arm;
a second shackle of loop form pivotally secured to the distal remote end of the compression lever;
a third shackle of loop form pivotally secured to the compression lever intermediate its ends;

spring means between the compression lever and the main lift arm constantly biasing the movable jaw toward the fixed jaw;

a whip wire extending through the first shackle, connected to the third shackle, and secured to a lift source; and

a tag line secured to the second shackle to open said jaws, whereby upon clamping of said jaws on the projecting ledge of the I beam, the I beam may be lifted or moved by manipulation of the whip wire to desired position and the clamp thereafter released by slacking of the whip wire and pulling of the tag line.

3,995,905

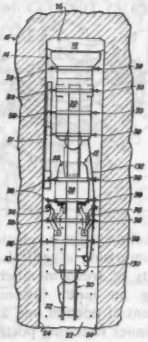
METHOD AND APPARATUS FOR ROOF BOLTING AND TRANSFERRING MINED MATERIAL

Will B. Jamison, Bethel Park, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,535

Int. Cl.² E21C *35/22, 35/24*

U.S. Cl. 299—11 **16 Claims**



12. A method of transferring mined material comprising,

conveying mined material dislodged from the face of a mine by a continuous mining machine into a material transfer apparatus positioned at one end portion in material receiving relationship with said continuous mining machine,

conveying the mined material longitudinally in said material transfer apparatus and into a haulage vehicle arranged to move into and out of material receiving relationship with the other end portion of said material transfer apparatus,

supporting the mine roof above said material transfer apparatus and adjacent the mine ribs substantially the entire length of said material transfer apparatus while said mining machine is dislodging material from the mine face,

drilling holes in the mine roof above said material transfer apparatus by a pair of roof drilling units mounted for horizontal pivotal movement on and vertically movable relative to the body portion of said material transfer apparatus,

installing roof bolts in the drilled holes by said roof drilling units as the mined material is being dislodged and conveyed from the mine face, and

controlling said continuous mining machine to dislodge material from the mine face from a position remote of said continuous mining machine and beneath a supported section of the mine roof adjacent said material transfer apparatus.

3,995,906

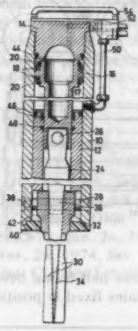
ROCK-SPLITTING APPARATUS

Helmut Darda, Im Tal, D-7712 Blumberg, Germany

Filed June 16, 1975, Ser. No. 587,384

Int. Cl.² E21C *37/04*

U.S. Cl. 299—22 **21 Claims**



1. Rock-splitting apparatus comprising a hydraulic piston-cylinder assembly in which a piston is reciprocable in a cylinder of uniform annular cross-section, between a cylinderical cover member at one end of the cylinder and one end of a sleeve of uniform annular cross-section disposed co-axially within the cylinder so as to engage the interior of the cylinder in oil-tight manner, a rod connected to the piston and mounted for movement along the sleeve, sealing means for sealing the space between the piston and the sleeve, a tapered slider wedge connected the piston rod, two presser cheeks mounted on opposite sides of the slider wedge for insertion into drill holes and having sliding surfaces which are sloped so as to be complementary to the tapered surfaces of the slider wedge and two transverse pins mounted in the cylinder and respectively engaging in transverse grooves formed in opposite sides of a head provided on each presser cheek to suspend the presser cheeks so that they are locked against axial movement relative to the cylinder, but capable of limited transverse movement.

3,995,907

UNDERGROUND EXCAVATING MACHINE HAVING INDEPENDENTLY MOVABLE HALF-FRAMES

Michel Dubois, Ittre, Belgium, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Aug. 21, 1974, Ser. No. 499,209

Claims priority, application Luxembourg, Aug. 22, 1973, 68283

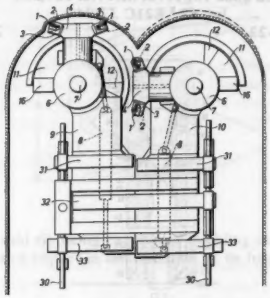
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² E21D *9/10*

U.S. Cl. 299—31 **29 Claims**

1. A machine for excavating an underground gallery, comprising a frame structure consisting essentially of two half-frames vertically arranged side by side, means for supporting each half-frame on the gallery floor independent of the other half-frame, two parallel vertical shafts respectively supported by said two half-frames, a separate turret pivotally supported around each of said shafts, each of said turrets having a cutting head which can rotate around a horizontal axis and which is equipped with tools for excavating, said two half-frames being movable horizontally in relation to one another, a control member connected between said half-frames for controlling

said relative movement, the two half-frames being selectively and independently positionable on the gallery floor by said



relative movement, one half-frame being movable while the other half-frame remains fixed in position.

3,995,908

HYDRAULIC-MECHANICAL COAL MINING COMBINE

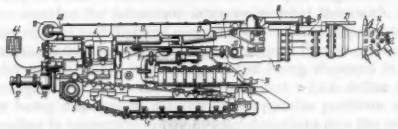
Gennady Innokentievich Razgildeev, ulitsa Michurina, 5, kv. 28, Novokuznetsk Kemerovskoi oblasti; Boris Yakovlevich Ekber, ulitsa Zoologicheskaya, 3, kv. 73, Moscow; Petr Ipatovich Jurin, ulitsa Chernomorskaya, 2, kv. 12, Novokuznetsk Kemerovskoi oblasti; Vladislav Markovich Kernichansky, ulitsa Klimenko, 32, kv. 3, Novokuznetsk Kemerovskoi oblasti; Alexandr Semenovich Gorbachev, prospekt Pionersky, 25, kv. 46, Novokuznetsk Kemerovskoi oblasti; Grigory Markovich Timoshenko, bulvar Pushkina, 27, kv. 33, Donetsk; Stanislav Antonovich Lenenko, ulitsa Krasnoflotskaya, 76, kv. 12, Donetsk, and Valery Dmitrievich Namleev, prospekt Ilicha, 9, kv. 51, Donetsk, all of U.S.S.R.

Filed Dec. 8, 1975, Ser. No. 638,309

Claims priority, application U.S.S.R., Dec. 9, 1974, 2078751

Int. Cl.² E21C *25/60*

U.S. Cl. 299—56 **1 Claim**



1. A hydraulic-mechanical coal mining combine comprising: a crawler carriage; a drive for moving said crawler carriage mounted in said crawler carriage; electric and hydraulic apparatus for the combine control mounted in said crawler carriage; a supporting bed plate fixed in said crawler carriage and having a bed plate channel, said channel being essentially a hydraulic shock acceleration tubing, said channel being bent in such a manner that its sections are located one above another in at least two rows, said channel having an inlet and an outlet; a turntable fixed in said crawler carriage and resting on said supporting bed plate; an actuator of said combine having a bit and hollow body, hinged to said turntable; a motor for rotation of said bit mounted in said turntable; hydraulic cylinders for moving said actuator in vertical and horizontal directions hinged to said turntable; a monitor having a barrel hinged to a standpipe, said standpipe being built in the hollow body of said actuator; hydraulic cylinders hinged to said standpipe and to said hollow body of said actuator for moving the barrel of said monitor in vertical and horizontal directions; a manifold fixed to said crawler carriage, said turntable and said actuator and communicting with a water supply source for supplying water to said actuator; a pneumohydraulic accumulator connected to the inlet of said channel and to the water supply source, said accumulator being made in said supporting bed plate and being set on said crawler carriage; and an oscillator located on said supporting bed plate and connected to the outlet of said channel and included in the water supply network of said monitor.

3,995,909

VEHICLE ANTI-SKID MECHANISMS

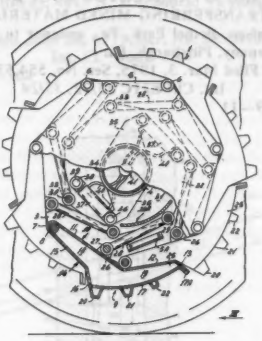
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jan. 8, 1975, Ser. No. 539,504

Claims priority, application Netherlands, Jan. 15, 1974, 7400507

Int. Cl.² B60B *15/26*

U.S. Cl. 301—47 **28 Claims**



1. A traction attachment for a vehicle wheel having a hub, said attachment comprising a central portion connected to said hub; a plurality of tread members, each of said tread members including an inner fastening portion pivotally mounted to said central portion and an outer tread portion connected to said inner fastening portion; and setting means interconnecting said central portion and each of said fastening portions for simultaneously pivoting all of said tread members between an inoperative, withdrawn position and operative, ground engaging positions; each of said fastening portions including an outer flat portion and each of said tread portions including an inner flat portion, said inner flat portion of each tread member being in abutting relationship with said outer flat portion of an adjacent tread member in said inoperative withdrawn position whereby said tread members form a closed wall around said central portion; said setting means including at least one hydraulic piston and cylinder assembly housed within said central portion.

3,995,910

CIGARETTE FILTER ROD TRANSFER APPARATUS HAVING ROD KINETIC ENERGY ABSORBER

Charles Gary Atwell, Mechanicsville, Va., assignor to Philip Morris Incorporated, New York, N.Y.

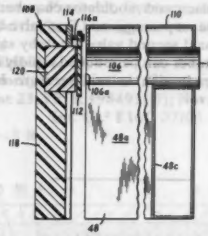
Filed Mar. 26, 1975, Ser. No. 562,169

Int. Cl.² B65G *51/02*

U.S. Cl. 302—2 R **16 Claims**

10. An energy absorber for dissipating kinetic energy of articles transported into impacting relation therewith comprising: a support defining a cavity therein, a block of resilient

material seated in said cavity and extending outwardly of said support, a flexible plastic sheet member and means securing



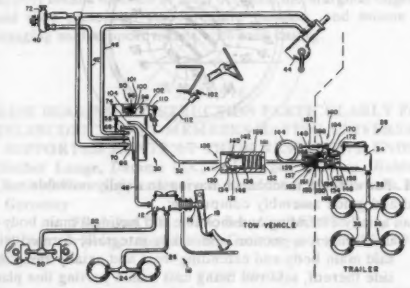
said sheet member to said support in overlying relation to said block of resilient material.

3,995,911

TOW VEHICLE-TRAILER BRAKING SYSTEM

John T. Kasselmann, and Thomas B. Fenzel, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Sept. 29, 1975, Ser. No. 618,295
Int. Cl.² B60T *13/16*
U.S. Cl. 303—2 8 Claims



1. In a tow vehicle-trailer braking system having a first servomotor for operating a first braking system in the tow vehicle and a second servomotor for operating a second braking system in the trailer, control means responsive to an actuation signal for operating the second servomotor, said control means comprising:

a first housing having a first bore and a second bore therein, said housing having a first entrance port connecting the first bore with said first braking system, a second entrance port connecting said second bore with a fluid output of a pump located in said tow vehicle, a first exit port for connecting said second bore with a fluid operating apparatus in the tow vehicle, a second exit port for providing a return connection to said pump for said fluid output in said second bore, and a first control port for connecting said second bore with said second servomotor;

first piston means located in said first bore having a face responsive to fluid pressure in the first braking system for moving a first end;

second piston means located in said second bore having a first cylindrical section with a series of lands thereon for regulating the communication of said fluid output of the pump between the second entrance port, the first exit port, the control port, and the second exit port, said cylindrical section having an axial passageway for allowing any fluid output present in said second bore to be of equal pressure across said lands, said second piston means having a second cylindrical section with a second end thereon; and

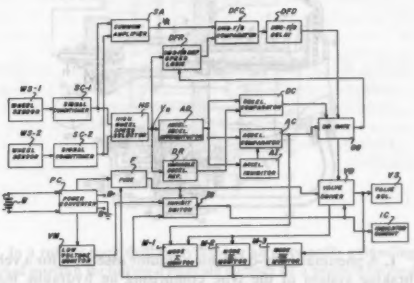
lever means pivotally positioned on said first housing for transmitting a first operational force, derived from fluid pressure in the first braking system acting on said first end of the first piston, to the second end of the second piston, said first operational force moving said second cylindrical section such that said lands on said first cylindrical section divert a portion of said fluid output from said pump from said second entrance to the control port for simultaneously actuating the second servomotor with the first servomotor.

3,995,912

SKID CONTROL SYSTEM

Joseph H. McNinch, Jr., Oak Park; John A. Urban, Livonia, and Gary L. Hopkins, Southfield, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 326,676, Jan. 26, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,246
Int. Cl.² B60T *8/00*
U.S. Cl. 303—21 AF 4 Claims



1. A skid control system for use with a vehicle having at least first and second spaced apart independently rotatable wheels and a braking system for applying braking forces to said wheels and comprising:

brake control means responsive to a skid signal for controlling said braking system to release the braking forces on said wheels;

means for providing first and second wheel speed signals respectively representative of the wheel speeds of said first and second wheels;

logic circuit means for utilizing said first and second wheel speed signals to determine an incipient skid condition of at least one of said wheels and providing a skid signal;

monitoring means for monitoring at least one system failure condition characteristic of said skid control system and inhibiting operation of said brake control means so as not to be responsive to said skid signal when the said characteristic of said skid control system is not within desired limits, said operation of said brake control means being inhibited for a time period dependent upon said characteristic being monitored;

said brake control means including energizable solenoid valve means for, when energized, acting upon said braking system to release braking forces on said wheels and valve driver circuit means responsive to said skid signal for energizing said valve solenoid means, actuation of said valve driver circuit means being inhibited in response to detection of a monitored operating characteristic exhibiting an erroneous skid control condition;

said monitoring means including circuit means for monitoring the time duration of said skid control signal and disabling said valve driver circuit means when the skid signal lasts for a time duration greater than a predetermined time duration; and

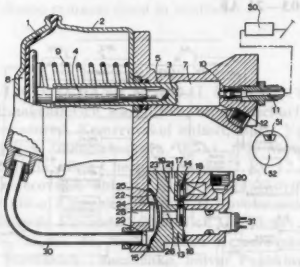
said logic circuit means including circuit means for providing said skid signal when the acceleration rate of the faster wheel exceeds a reference level; said skid signal time duration circuit means including circuit means for inhibiting operation of said valve driver circuit means only in the event that a said skid signal lasts for a time duration greater than that of the predetermined time duration unless said skid signal is provided within said time duration by said acceleration circuit means.

3,995,913

ACTUATOR ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

David Anthony Harries, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Dec. 11, 1975, Ser. No. 639,872
Claims priority, application United Kingdom, Dec. 17, 1974, 54554/74; Apr. 24, 1975, 17105/75
Int. Cl.² B60T 8/00
U.S. Cl. 303—21 F 15 Claims



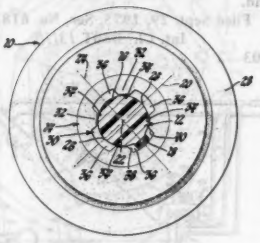
1. A pneumatically-operable actuator assembly for a vehicle braking system of the type comprising an hydraulic master cylinder for supplying hydraulic fluid under pressure to at least one hydraulic slave cylinder of a wheel brake, and a valve between said master cylinder and said slave cylinder, the actuator assembly comprising at least one modulator assembly comprising a housing having a chamber for communication with the master cylinder, an outlet port for connection to the slave cylinder, and a bore communicating with said chamber and in which works an expander piston movable between a first advanced position in which the effective volume of said chamber is at a minimum and said valve is open and a second retracted position in which said valve is closed and the effective volume of said chamber is larger, said expander piston being disposed in said first position but movable into said second position when the deceleration of a braked wheel operated by the slave cylinder exceeds a predetermined value, said housing also having a modulator chamber adapted to be pressurized by pneumatic pressure to control the position in said bore of said expander piston, and a control valve assembly responsive to a signal from deceleration sensing means for controlling said pneumatic pressure in said modulator chamber, wherein said control valve assembly comprises a body having an inlet passage for connection to a supply of air, a supply chamber through which said inlet passage is connected to said modulator chamber, and an exhaust passage, a first valve responsive to the said signal for controlling communication between said inlet passage and said supply chamber, and a second valve downstream of said first valve and responsive to pressure in said supply chamber to control communication between said modulator chamber and said exhaust passage, the arrangement being such that when the said signal is inoperative said first valve is in an open position in which said inlet passage is in communication with said supply chamber and pressure in said supply chamber holds said second valve in a closed position in which said modulator chamber is isolated from said exhaust passage, and when the said signal is operative said second valve isolates said inlet passage from said supply chamber and reduces said pressure in said supply chamber so that said second valve can move away from said closed position to place said modulator chamber in communication with said exhaust passage, said first valve being substantially smaller than said second valve whereby said pressure in said modulator chamber can be reduced rapidly in response to a relatively small reduction in said pressure in said supply chamber.

3,995,914

ROD AND GUIDE ASSEMBLY

Michael M. Schardt, Kettering, and John T. Smith, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1975, Ser. No. 605,413
Int. Cl.² F16C 17/00
U.S. Cl. 308—3 R 1 Claim



1. For use in a mechanism having an axially movable rod, a rod and guide assembly comprising:

an axially extending and movable rod having a main body of uniform cross section and a key integrally formed with said main body and extending from and axially along one side thereof, said rod being cast with a parting line plane passing axially therethrough at substantially right angles to a plane passing through the center of said key and the axis of the rod main body;

and a rod guide member having a guide aperture through which said rod extends and relative to which said rod is axially movable, said aperture being defined by circumferentially spaced axially extending wall sections and having circumferentially spaced and radially and axially extending recesses therebetween, at least one of which is bisected by a radially and axially extending first plane lying perpendicular to a radially and axially extending second plane passing through two circumferentially opposite recesses, at least portions of said wall sections circumferentially intermediate said recesses defining bearing and guide surfaces for said rod main body for free axial rod movement in said aperture;

said rod key being received in one of said at least one of said recesses in a circumferentially oriented position relative to said rod guide member for free axial rod movement and engageable with either of the side walls of said one recess to prevent any substantial rod rotational movement to maintain said circumferentially oriented position, said rod parting line plane passing through said two circumferentially opposite recesses so that any flash or parting line mismatch on said main body lies therein and cannot contact said guide member, thereby minimizing the possibility of the rod sticking due to parting line mismatch or flash interference.

3,995,915

SLIDING BEARING FOR BRIDGES OR SIMILAR STRUCTURES

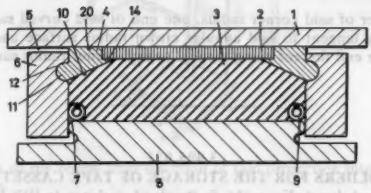
Waldemar Koster, Forsbach, Germany, and Reinhold Huber, Rrobas, Switzerland, assignors to Kober AG, Glarus, Switzerland

Filed Dec. 19, 1975, Ser. No. 642,256

Claims priority, application Germany, Dec. 27, 1974, 2461708; June 23, 1975, 198491[U]; Nov. 14, 1975, 2551085

Int. Cl.² F16C 27/06

U.S. Cl. 308—3 R 19 Claims



1. A slide-rocker bearing comprising a pair of spaced bearing members an elastic pressure cushion arranged between said bearing members, a casing at least in part peripherially enclosing said pressure cushion and spaced from said bearing members so as to permit tilting thereof, a slide plate interposed between one of said bearings and said pressure cushion, support means inserted at least between the marginal edges of said slide plate and said pressure cushion, and means for engaging said support means with said casing.

3,995,916

SLIDE BEARING CONSTRUCTION PARTICULARLY FOR TELESCOPIC SHAFT MEMBERS HAVING UNIVERSAL SUPPORTED JOINTS AT THEIR RESPECTIVE ENDS

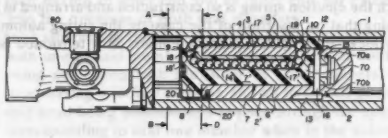
Günther Lange, Damme i.O., and Jürgen Ulderup, Haldem, both of Germany, assignors to Lemforder Metallwaren AG, Germany

Filed Jan. 28, 1976, Ser. No. 653,076

Claims priority, application Germany, Aug. 30, 1975, 2538686

Int. Cl.² F16C 29/00

U.S. Cl. 308—6 C 6 Claims



1. A slide bearing construction, comprising a first part having a hollow receiving end portion, a second part telescopically slidable in said first part hollow end portion, the inner surface of said first part hollow end portion and the periphery of said second part defining complementary axially extending ball circulating groove portions which together define outer axially extending ball circulating groove portions, said second part having a cavity therein including an axially extending cavity defining a radially inner ball circulating groove part which extends substantially parallel to said radial outer groove part, said cavity in said second part having a radially extending groove portion at the inner end of said cavity with deflection means defining therewith a first curved ball circulating groove communicating between said outer and inner ball circulating groove portions, said second part having a collar portion adjacent the end which is positioned in said first part and which defines a second curved ball circulating groove communicating between said outer and inner ball circulating groove parts, said first and second curved ball circulating groove portions, said outer and inner ball circulating groove portions together defining a continuous ball circulating race, and ball bearings in said race.

3,995,917

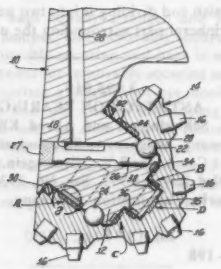
ALUMINUM BRONZE BEARING

John R. Quinlan, Buena Park, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 418,310, Nov. 23, 1973, abandoned. This application Sept. 24, 1975, Ser. No. 616,401

Int. Cl.² F16C 19/00

U.S. Cl. 308—8.2 10 Claims



1. In a rotary rock drill body having an outwardly extending journal portion including a bearing surface of a predetermined hardness, and a rotary cone cutter rotating upon said portion, said cutter having an inner peripheral recess opposite said journal portion, bearing structure supported in said recess in journal portion engaging relation, said bearing structure comprising heat-treated aluminum bronze bearing composed of a bearing metal matrix of a first hardness and matrix-dispersed bearing particles of a second hardness greater than said matrix hardness and less than said predetermined journal portion bearing surface hardness whereby said bearing surface is adapted for relatively movable contact with the heat-treated aluminum bronze and said matrix dispersed particles therein.

3,995,918

SYSTEM FOR BEARING A NUCLEAR REACTOR VESSEL COOLED BY LIQUID METAL

Armel Mahe, Palaiseau, and Georges Jullien, St-Michel-sur-Orge, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 29, 1975, Ser. No. 609,167

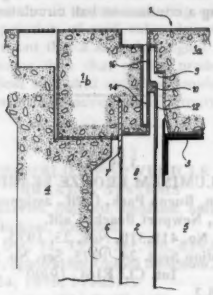
Claims priority, application France, Aug. 29, 1974, 74.29544

Int. Cl.² F16C 1/24

U.S. Cl. 308—77 7 Claims

1. A bearing system for supporting a nuclear reactor vessel cooled, for example, by liquid metal, the vessel being of the kind which is suspended from the reactor closure slab, the system being characterised in that it comprises a ring connected at one end to a collar and at the other end to two collars, the collar connected to the bottom end of the ring forming the top part of the vessel to be supported, the other

two collars fitting into the slab at two separate places, and the ring and collar assembly being disposed in an annular space



formed in the slab and dividing it into two parts, i.e. a central part and a peripheral part surrounding the central part.

3,995,919

ANTIFRICTION BEARING

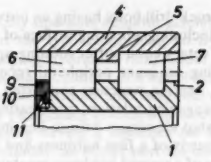
Walter Boeck, Schweinfurt, and Alfred Köelle, Gochsheim, both of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed July 3, 1975, Ser. No. 593,175

Claims priority, application Germany, July 26, 1974, 2435965

Int. Cl.² F16C *13/00*

U.S. Cl. 308—198 10 Claims



1. In a rolling bearing of the type having first and second opposed races, rolling members positioned to roll between said races, a shoulder extending from at least one of said races to inhibit removal of said rolling members from between said races, a loading aperture extending through said shoulder to permit the loading of rolling members into said bearing, a closure member, said loading aperture also extending partially into said race adjacent said shoulder to form a seat for said closure member, said closure member being fitted in said loading aperture to inhibit removal of said rolling members by way of said aperture, and means for holding said closure member in said aperture and against said seat, the improvement wherein said closure member is expandable and has a recess facing said seat, and said holding means comprises an element engaging said seat and extending into said recess for expanding the material of said closure member outwardly against the walls of said aperture.

3,995,920

ROLLER BEARING

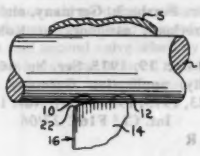
Louis J. Bucha, 2800 Bernice Road, Lansing, Ill. 60438

Filed Aug. 6, 1973, Ser. No. 386,081

Int. Cl.² F16C *33/00*; B21B *7/02*

U.S. Cl. 308—216 7 Claims

1. An outer race of a roller bearing comprising: an annular crown radius surface; an annular corner radius surface; and an annular curved surface therebetween having radii which uniformly diminish from the center of said crown radius to the



center of said corner radius, one end of said curved surface being tangent to said annular crown radius surface and the other end thereof being tangent to said corner radius surface.

3,995,921

HOLDERS FOR THE STORAGE OF TAPE CASSETTES

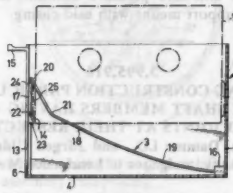
Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

Filed May 30, 1975, Ser. No. 582,129

Claims priority, application Germany, June 5, 1974, 2427106

Int. Cl.² A47B *81/00*; B65D *39/00*

U.S. Cl. 312—12 11 Claims



1. A holder for tape cassettes and the like in the form of a rectangular housing which has an entrance along one of its narrow sides for the insertion of the cassette, wherein when a locking means is released, the cassette is moved into a convenient removal position by means of a resilient ejection spring stressed by the insertion movement of the cassette and in which the ejection spring is so constructed and arranged in the housing that on insertion of the cassette the spring automatically locks itself with housing members in a tensioned position.

3,995,922

PREFABRICATED REACH-IN REFRIGERATOR-FREEZER

Teruo Ohashi, 20, Ogi, Aizuwakamatsu, Japan

Filed July 7, 1975, Ser. No. 593,406

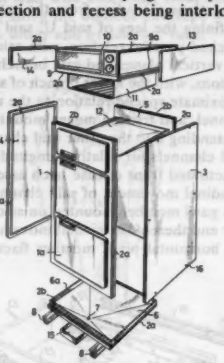
Claims priority, application Japan, July 10, 1975, 50-82014

Int. Cl.² A47B *43/00*, *77/08*

U.S. Cl. 312—257 R 9 Claims

1. A prefabricated set for assembling a reach-in refrigerator-freezer comprising: a floor panel, a front panel with doors, right and left side panels, a back panel and a ceiling panel supporting a refrigerating unit, said respective panels being joined and assembled with connecting and sealing removable joints consisting of (1) a projection on one panel comprising two members, the distance between which at first becomes wider and then progressively narrows outward, and of (2) a recess on another panel consisting of two members the dis-

tance between which becomes progressively narrowed outward, said projection and recess being interlocked by resilience of the recess after insertion of said projection into said recess.



3,995,923

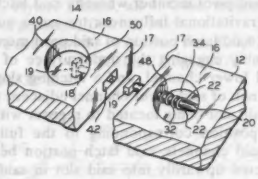
PANEL LOCKING ARRANGEMENT

Irving W. Shell, 442 Wellington Ave., Chicago, Ill. 60657

Filed Mar. 20, 1975, Ser. No. 560,370

Int. Cl.[2] F16B *17/00*, *12/00*

U.S. Cl. 312—111 16 Claims



1. A lock for securing a panel member to a wall member, each of said members including a front edge and a back edge, said lock comprising:

an opening formed in each of said members, for communicating the front edge to the back edge;

a shaft having an inner end and an outer end, for extending into the openings of both said members;

a head attached to the outer end of the shaft for associating with one of said members and the inner end of the shaft being associated with the other of said members, said head having a locked-position and an unlocked-position, said head being dimensioned to pass through the opening corresponding to said one member when in the unlocked position and being prevented from passing through when in the locked-position; and

resilient means positioned on said shaft and associated with said other member for locking said panel and wall members together when the head is in the locked-position, said panel and wall members being unlocked when the head is in the unlocked-position.

3,995,924

APPARATUS FOR SORTING CLOTHES

Charlotte B. Jones, 17621 Irvine Blvd., Suite 101, Tustin, Calif. 92680

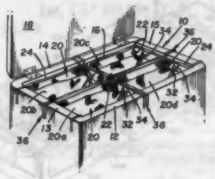
Filed Feb. 3, 1975, Ser. No. 546,310

Int. Cl.[2] B65B *67/12*; A47B *81/00*

U.S. Cl. 312—211 4 Claims

1. In combination with an apparatus for sorting and storing clothes which is removably disposed within the compartment of a clothes hamper, wherein the improved apparatus comprises:

an adjustable central-support stand positioned within said compartment of said hamper, said central-support stand includes a central telescoping support post, means for adjusting the height of said telescoping support post, wherein said telescoping support post is affixed to an adjustable base member and means for securing said support post to said base member;



a plurality of bags equally arranged and juxtapositioned within said hamper, and removably secured therein; and

means for removably securing said bags in said hamper;

wherein said means for removably securing said bags in said hamper comprises a plurality of eye hooks mounted to said hamper and said cnetral telescoping support post, whereby the end of each bag is removably secured thereto said base member comprising a first elongated leg member and a second leg member secured to said first leg member intermediate the ends thereof and at right angles thereto, forming a substantially cross - configuration therewith.

3,995,925

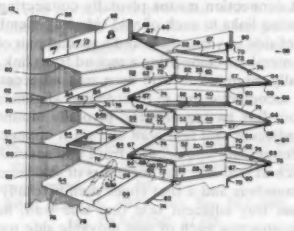
COMBINED PRODUCT DISPLAY AND STORAGE UNIT

Guenter R. Roesler, 18 First Road, Marlboro, Mass. 01752

Filed Sept. 16, 1974, Ser. No. 506,096

Int. Cl.[2] A47B *67/02*, *97/00*

U.S. Cl. 312—234 9 Claims



1. In a combined merchandising product display and storage device, the combination of two end panels having between them a plurality of shelves positioned one above the other with storage spaces therebetween and having front edges, the end panels extending a distance beyond the front edges of the shelves, a series of horizontally disposed trough-like formations positioned side-by-side with one above the other at said front edges of the shelves and between said panel extensions *in manner to shield associated storage spaces from view*, each trough-like formation having an upper and a lower outwardly extending side, the lower side of each of said trough-like formations being comprised of a plurality of contiguous product display platforms in a row at the upper side of the next lower trough-like formation, each product display platform being fulcrumed to pivot upwardly to provide access to the storage space on an associated one of said shelves.

3,995,926

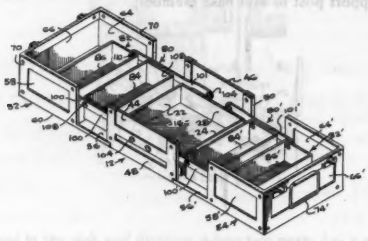
FLAT-OPENING BOX

Clarence J. Kessler, Sr., Lexington Ave., Rte. 1, Box 162, Rincon, Ga. 31326

Filed Jan. 15, 1976, Ser. No. 649,495

Int. Cl.[2] A47B *88/00*, *53/00*, *95/02*; A47F *5/00*

U.S. Cl. 312—325 8 Claims



1. A flat-opening box comprising a centrally positioned base tray having a first side wall, a second side wall, a rear wall, a front wall and a floor panel, a plurality of movable side tray members each having a bottom panel oriented parallel to said floor panel and linkage means connecting said base tray and said side tray members for movement of said side tray members along a path in which said bottom panels remain parallel to said floor panel between a first or open position in which said side trays are positioned in horizontal alignment with said base tray and a second position in which said movable side tray members are vertically aligned above said base tray, wherein said movable side tray members comprise a first bank of side tray members which when positioned in said first or open position are positioned outwardly of said first side wall of said base tray and a second bank of side tray members which when positioned in said first or open position are positioned outwardly of said second side wall of said base tray and said linkage means includes a first pair of elongated swing link members comprising a front link having one end pivotally mounted on said base tray adjacent said front wall and a rear link in front to rear alignment with said front link having one end pivotally mounted on said base tray adjacent said rear wall, pivot connection means pivotally connecting said front and rear swing links to each of said side tray members of said first bank of side tray members and a second pair of elongated swing link members comprising a second front link having one end pivotally mounted to said base tray adjacent said front wall and a second rear link in front to rear alignment with said second front link having one end pivotally mounted on said base tray adjacent said rear wall and pivot connection means piovtally connecting said second front and second rear swing links to each of said side tray members of said second bank of side tray members and a first cover shell pivotally connected to said base tray adjacent said first side wall, hinge means pivotally connecting each of said movable side tray members of said first bank of side tray members to said first cover shell, a second cover shell hingedly connected to said base tray adjacent said second side wall and hinge means connecting said movable side tray members of said second bank of side tray members to said second cover shell.

3,995,927

FRONT RELEASE DRAWER SLIDE

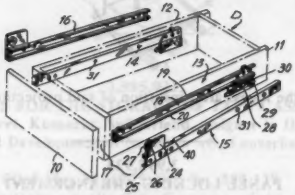
Robert R. Stein, Mt. Kisco, N.Y., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,238

Int. Cl.[2] A47B *88/16*; F16C *21/00*

U.S. Cl. 312—333 3 Claims

1. A front removable drawer slide assembly comprising, in combination, first and second elongate channels generally U-shaped in transverse section, said channels each including a central web defining the branch of said U and a pair of spaced parallel track portions extending from the extremities of said branch and defining the legs of said U, said channels being disposed in stacked parallel relation, with said webs being in laterally offset vertical planes and said branches extending in opposite directions, with the lower branch of said upper channel being in proximate spaced relation to the upper branch of said lower channel, anti-friction means mounted on each said channel and extending into the other said channel for slidably supporting said channels for relative longitudinal movement, and a gravity actuated front release latch assembly releasibly limiting longitudinal movement of said channels, said assembly including a pawl member mounted on said upper channel adjacent a rear end thereof for pivotal movement in a vertical plane about a horizontal pivot member fixed to said upper



channel, said pawl being normally disposed entirely within said lower channel and including at the rear end thereof a vertically directed latch portion, and at the outer end thereof a forwardly extending trip portion, said pawl being unbalanced about said pivot member whereby said latch portion is urged under gravitational influences toward a normally elevated position, said latch portion of said pawl member underlying and slidably engaging the undersurface of said upper branch of said lower channel, and a latching slot formed in said upper branch of said lower channel adjacent the forward end thereof, said slot being located to register with said latch portion at a position corresponding to the fully extended condition of said channels, said latch portion being gravitationally projected upwardly into said slot in said registering position, whereby said channels are locked against further outward sliding movement.

3,995,928

HIGH PRESSURE METAL HALIDE LAMP WITH ELECTRON COLLECTOR

Richard O. Shaffner, Willoughby, and William E. Smyser, Chagrin Falls, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 13, 1975, Ser. No. 540,322

Int. Cl.[2] H01J *61/18*, *61/54*; H05B *31/18*

U.S. Cl. 315—60 4 Claims

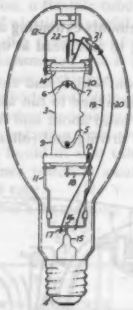
2. A high pressure metal halide discharge lamp for base up operation comprising:

a tubular fused silica arc tube having electrodes sealed into opposite ends and containing an ionizable fill including mercury and sodium halide, said arc tube having an auxiliary starting electrode at the upper end and a dummy pin at the lower end;

a generally bulbous vitreous outer envelope surrounding said arc tube, closed at the upper end and having a base with terminals at the lower end, said outer envelope having a pair of stiff inleads extending thereinto through a stem and connected to said base terminals;

a divided mount comprising a base end support frame fastened to one of said inleads and attached to said arc tube and electrically connected to the electrode at the upper end thereof, and a closed end support frame attached to the lower end of said arc tube and engaging the closed end of said outer envelope, said divided mount providing substantially the entire physical support of said arc tube;

a fine resilient lead wire extending from said other inlead and curving along the bulbous envelope wall to the electrode at the lower end of said arc tube;



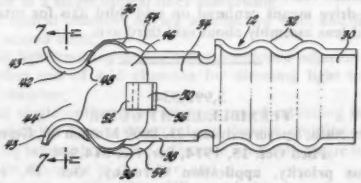
and a collector wire extending alongside and close to said lead wire, said collector wire being connected to said one inlead at the upper end and to said dummy pin at the lower end and serving to collect photoelectrons from said lead wire that would otherwise drift to the arc tube.

3,995,929

FEMALE TERMINAL

Paul S. Ghirardi, Masury; Herbert R. Lilley, Cortland, and Robert G. Plyler, Vienna, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1974, Ser. No. 520,923
Int. Cl.² H01R *27/00, 15/12*
U.S. Cl. 339—32 R **8 Claims**



1. A unitary sheet metal female electrical terminal adapted for detachable connection with an enlarged ball-like head of a stud terminal in a longitudinal as well as a transverse relationship comprising:

a ferrule portion adapted to be crimped about an end of a lead wire,

a bridge portion integrally connected to a forward end of said ferrule portion,

a pair of transversely spaced longitudinally resilient fingers having rearward portions integrally connected to said bridge portion and forward portions extending away from said ferrule portion,

a transverse resilient tongue integrally connected at the forward end of said bridge portion, said transverse resilient tongue being substantially upright with respect to a longitudinal axis of the terminal and having a forwardly bowed mid portion disposed between said pair of transversely spaced longitudinally resilient fingers, and

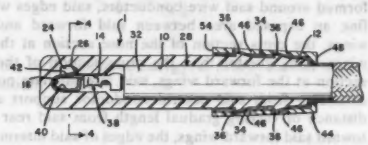
said forward portions having inwardly depressed transversed bight portions spaced longitudinally from said transverse resilient tongue and providing forwardly converging portions and a longitudinal throat, said forwardly converging portions having concavo-convex transverse cross sections which are concave in the inward direction for engaging and retaining an enlarged ball-like head of a stud terminal engaged on an opposite side by said resilient tongue and for providing a transverse throat in cooperation with said resilient tongue.

3,995,930

HIGH VOLTAGE TUBE CONNECTOR

Henry Otto Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 2, 1975, Ser. No. 583,303
Int. Cl.² H01R *13/36*
U.S. Cl. 339—143 R **3 Claims**



1. A right angle connector for a high voltage electrical tube and a high voltage lead, comprising:

an elbow shaped dielectric shell having one end portion provided with outwardly projecting teeth,

a conductive sheath of an electrical lead received over said one end portion of said shell and covering said outwardly projecting teeth,

a complimentary sleeve slidably received over said one end portion of said shell and captivating therebetween said conductive sheath,

said sleeve being provided with apertures disposed over said sheath and latchably receiving therein corresponding sheath covered teeth,

polarizing means in one end of said sleeve orienting said sleeve onto said one end portion of said shell,

a first recess in said one end portion of said shell for receiving said electrical lead therein together with an electrical contact terminated to said lead,

said first recess ending in a contact seating portion,

said contact seating in said contact seating portion and preventing removal of said terminated lead, and

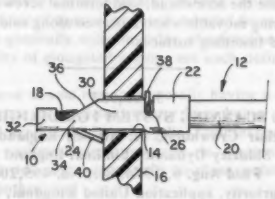
the other end portion of said shell being at a right angle with said one end portion and provided with a second recess communicating with said contact seating portion of said first recess for pluggably receiving a plug end of a high voltage electrical tube in electrically connected relationship with said contact.

3,995,931

TERMINAL FOR APERTURED CIRCUIT PANEL

Stanley A. Pienkowski, Glendale Heights, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 26, 1975, Ser. No. 562,340
Int. Cl.² H01R *11/08*
U.S. Cl. 339—217 S **5 Claims**



1. A crimp-type terminal adapted to be electrically connected to the conductors of a wire and inserted into an aperture formed in a circuit panel, said terminal comprising:

an elongated nose section adapted to be received through said aperture, said nose section including a central conductor support area for supporting the conductors of the wire, a pair of rear wings extending outwardly in opposite directions from the support area around the conductors to substantially conform with the cross section of the aperture, a pair of forward wings extending outwardly in opposite directions from the support area around the conductors in a gripping fashion, and a pair of reduced intermediate portions between said forward and rear wings, each having an edge, said intermediate portions extending a sufficiently small distance from said central conductor support area so that when said nose section is formed around said wire conductors, said edges will define an exposed area between said forward and rear wings, the cross section of the nose section at the rear wings being greater than the cross section of the nose section at the forward wings, said intermediate portions extending from said central conductor support area a distance of varying gradual length from said rear wings toward said forward wings, the edges of said intermediate portions defining a ramp to aid in the insertion of the nose section through the aperture.

3,995,932

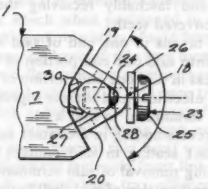
TERMINAL FOR CONVERTIBLE CONTACT MODULE

Edward H. Kuhn, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed June 20, 1975, Ser. No. 588,660

Int. Cl.² H01R 9/10

U.S. Cl. 339—245 **10 Claims**



1. An electrical terminal for a contact module having a housing which is adapted for mounting on a switch structure in either of two orientations, the combination comprising:

a terminal strap fastened to said housing and having a pair of fastening surfaces that lie in separate planes, said terminal strap having a slot which defines a pair of spaced guide rails that connect the fastening surfaces;

a terminal screw having a shank portion which extends through said slot and a head portion which cooperates with one of said fastening surfaces to hold a wire in place; and

a nut fastened to the shank of said terminal screw and in bearing engagement with the terminal strap on the side opposite the screwhead, said terminal screw and attached nut being movable when loosened along said slot to either of said fastening surfaces.

3,995,933

OPTICAL SCANNING SYSTEM FOR DIRIGIBLE HEADS

James Arthur Crowhurst, St. Albans, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Aug. 6, 1974, Ser. No. 495,208

Claims priority, application United Kingdom, Aug. 6, 1973, 37190/73

Int. Cl.² G02B 27/17

U.S. Cl. 350—6 **4 Claims**

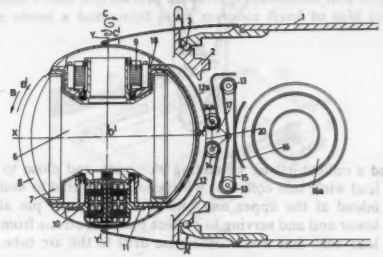
1. Apparatus including a generally spherical rotary scanning head for use in a vehicle, said scanning head being mounted to be movable angularly about first, second and third mutually orthogonal axes, said head bearing an arcuate track following a path generated about said first axis as center, said apparatus further comprising:

a support body,

flexible elongated elements extending along said track from points of fastening to said head at opposite sides of said first axis,

respective rollers about which said elements are wrapped, said rollers being arranged to run along said track as the movement of said head about said first axis takes place,

first drive means for driving said rollers along said track,



bearing means whereby said scanning head, with said flexible elongated elements and rollers and first drive means, is mounted for rotation, relatively to said support body, about said second axis in a manner to preclude separation of said scanning head from said support body during movement and attitude changes of said vehicle,

second drive means centered on said second axis for rotating said scanning head about said second axis,

a scanning lens assembly mounted on said scanning head for rotation relatively to said head about said third axis, and

third drive means centered on said third axis for rotating said lens assembly about said third axis.

3,995,934

FLEXIBLE LIGHT GUIDE

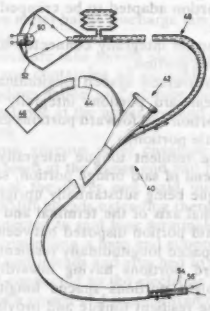
Gunther Nath, Speyererstrasse 21, 8000 Munich 40, Germany

Filed Oct. 15, 1974, Ser. No. 514,954

Claims priority, application Germany, Oct. 19, 1973, 2352670; July 11, 1974, 2433219

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96 LM **14 Claims**



1. An instrument for use with a source of infra red radiation

for applying radiation within a living body for medical purposes comprising a flexible light guide which comprises a column of a liquid having a predetermined refractive index and selected to absorb as little as possible of the wavelength range of said radiation, a flexible tube, surrounding and containing the liquid, of plastics material which has a refractive index somewhat smaller than that of the liquid in the wavelength range to be transmitted and is provided with a liquid-tight window at one end fashioned in a manner suitable for insertion into a living body and another liquid-tight window at the other end, said other end being fashioned in a manner suitable for receiving radiation from a radiation source outside the living body, the liquid in said tube being at rest, and a liquid supply container which is located near the radiation receiving end of said tube

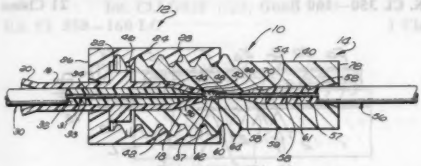
and is connected via a liquid duct with the interior of the flexible tube.

3,995,935

OPTICAL COUPLER

Ronald L. McCartney, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,429
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C **13 Claims**



1. A connector for coupling light from a light emitting device to a single optical fiber comprising:

an optical chamber having a reflective wall, and first and second ends;

said light emitting device being positioned adjacent to said first end of said chamber for directing light into said chamber;

said single optical fiber having an end extending into said chamber from said second end thereof, said fiber extending into said chamber a distance substantially greater than the diameter of the fiber; and

a light transmitting filler filling said chamber whereby light emitted into said chamber by said light emitting device will reflect off said chamber wall and impinge upon said fiber, said reflective wall having a configuration such that a substantial majority of said light emitted into said chamber will impinge upon the outer curved surface of said fiber and will enter said surface at an angle so as to propogate continuously through said fiber.

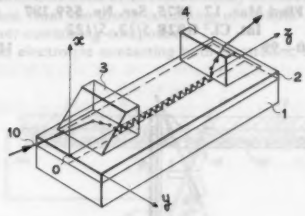
3,995,936

MAGNETO-OPTICAL PROPAGATION MODE CONVERTER

Georges Hepner, and Bernard Désormière, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 5, 1975, Ser. No. 602,009
Claims priority, application France, Aug. 9, 1974, 74.27764
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG **8 Claims**

1. A device for at least partially converting the propagation mode of radiated energy, utilising magneto-optical effects, from a first mode to a second mode, said device comprising a layer of a ferrimagnetic material in which the radiated energy is guided in accordance with the first mode, the magnetisation of said layer exhibiting at least one component in a direction normal to the propagation direction of said radiated energy, the thickness of said layer being such that the propagation



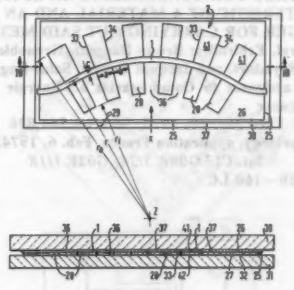
velocities of the radiated energy, in first of second modes, are substantially equal.

3,995,937

TUNABLE OPTICAL WAVE GUIDE SYSTEMS

Peter Baues, Krailling; Hans Mahlein, Munich; Achim Reichelt, Munich, and Gerhard Winzer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 3, 1975, Ser. No. 609,909
Claims priority, application Germany, Sept. 6, 1974, 2442652
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG **29 Claims**



1. Apparatus adapted for utilization in optical waveguide systems comprising

A. a substantially planar light transmissive continuous layer having a pair of spaced, opposed, parallel faces, said layer having a generally uniform index of refraction, and

B. a plurality of elongated regions are each defined in said layer,

1. each one of said regions generally having a hypothetical center line, all said center lines being adapted to extend through a common point upon extrapolation,

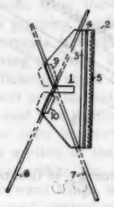
2. said regions being generally in circumferentially spaced, adjacent substantially co-planar relationship to one another, and

3. each one of said regions having an index of refraction which is either greater than or less than the index of refraction of said layer, all of said regions having a substantially similar index of refraction relative to one another.

3,995,938
CYCLE REFLECTOR

Gust A. Olson, 1527 Princeton St., Santa Monica, Calif. 90404

Filed Mar. 17, 1975, Ser. No. 559,287
Int. Cl.² G02B 5/12, 5/122
U.S. Cl. 350—99 10 Claims



1. An attachment for a wheel having wire-like spokes, comprising;

a. a substantially flat light-reflective body (2), having a fin (1,11,17,24,34) extending therefrom and between two spokes at their cross-over,

b. plural tabs (9,10,14,15,25,27,30,32,26,28,31,33,18,20) extending from said fin and spaced to engage at least two of said spokes (7,8) on opposite sides of the cross-over thereof,

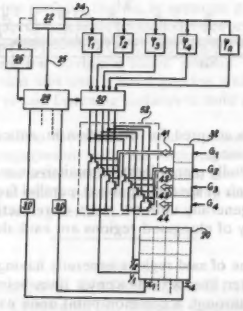
said tabs disposed with respect to said fin to fixedly retain the flat surface of said body in a plane substantially perpendicular to the plane (6) of said wheel,

for reflecting light substantially parallel to the plane of said wheel.

3,995,939
METHOD FOR CONTROLLING AN OPTICAL CHARACTERISTIC OF A MATERIAL AND AN ANALOG IMAGER FOR CARRYING OUT SAID METHOD

Joseph Borel, Echirolles; Bruno Dargent, Grenoble; Guy Labrunie, Seyssinet, and Jacques Robert, Saint-Engreve, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 28, 1975, Ser. No. 544,826
Claims priority, application France, Feb. 6, 1974, 74.03980
Int. Cl.² G08B 5/36; G02F 1/18
U.S. Cl. 350—160 LC 16 Claims



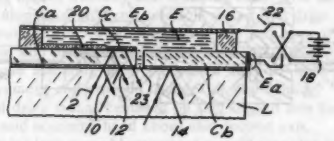
1. A method for controlling an optical characteristic of a material which is intercalated between two electrodes driven by periodic excitation signals having a zero mean value, wherein said method consists of applying to said electrodes, signals having the same time-duration and the same recurrence frequency but in which one signal has a phase shift ϕ with respect to the other and wherein said phase shift is modified to any values between 0 and π in order to adjust said characteristic to correspond to any value G of an input quantity to be displayed.

11. An analog imager for controlling an optical characteristic of a material, comprising a display cell constituted by said material intercalated between two electrodes driven by periodic excitation signals, said material being such as to have an optical characteristic which is dependent on said excitation, and comprising means for delivering said excitation signals to said electrodes, wherein said means comprise means for delivering excitation signals having equal recurrence frequency and equal duration but having a phase shift ϕ with respect to each other and means for modifying said phase shift to any values between 0 and π inorder to adjust said characteristic to correspond to any value G of an input quantity to be displayed.

3,995,940
LUMINOUS DISPLAY DEVICE

Pierre Guyon, St-Ismier, and Robert Meyer, St-Martin d'Heres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 10, 1975, Ser. No. 557,151
Claims priority, application France, Mar. 12, 1974, 74.08377
Int. Cl.² G02F 1/01
U.S. Cl. 350—160 R 21 Claims



1. A luminous display device comprising:

— a light source S,

— a uniform layer C_a of semi-reflecting material

— a uniform layer C_b of transparent and conducting material having a refractive index n and a thickness e deposited on the layer C_a, the layer C_b being such as to have an optical thickness which is constant and equal to ne as measured at right angles to the surface,

— a reflecting layer C_c deposited on part of the layer C_b in order to form the patterns which are intended to be read by an observer, the layers C_a, C_b and C_c constituting an interference filter,

— an electrolyte E in contact with the conductive layer C_b, and a first electrode E_a in contact with said layer C_b,

— a second metallic electrode E_b in contact with the electrolyte,

— a control voltage source for applying a potential difference between the electrodes E_a and E_b so as to ensure that the reflecting layer C_c which is deposited on at least part of the layer C_b is deposited when the electrode E_a is biased and redissolved under control action when the electrode E_a is inversely biased.

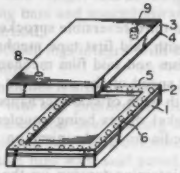
3,995,941
LIQUID CRYSTAL CELLS

Shigehiro Nagahara, Yokohama; Nobuyoshi Ichimura, Chigasaki, and Yoshiro Suzuki, Tokyo, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1972, Ser. No. 302,860
Claims priority, application Japan, Mar. 14, 1972, 47-25234
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 6 Claims

1. A liquid crystal cell comprising a couple of planar elements juxtaposed in parallel at a predetermined spacing and a

liquid crystal composition interposed between said planar elements, the edges of the cell being sealed with a sealant,



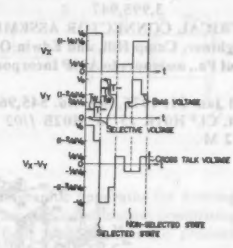
characterized in that said sealant is a low-melting glass comprising a mixture of crystallizable low-melting glass and non-crystallizable low-melting glass.

3,995,942

METHOD OF DRIVING A MATRIX TYPE LIQUID CRYSTAL DISPLAY DEVICE

Hideaki Kawakami, and Yutaka Yoneda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 21, 1975, Ser. No. 551,665
Claims priority, application Japan, Mar. 1, 1974, 49-23355
Int. Cl.² G02F 1/28; G08B 5/36
U.S. Cl. 350—160 LC **1 Claim**



1. A method of line-by-line scanning liquid crystal dots at the intersections of signal and scanning lines arranged in a matrix form, wherein a signal comprising a first voltage for exciting the liquid crystal dot into illumination and a second voltage for averaging a cross talk voltage across the liquid crystal dot in its non-selected state is applied to the signal line, the duration time of the first voltage being varied in accordance with a desired tone level and wherein the first voltage includes voltage portions of zero and V_0, the second voltage includes voltage portions of $(1 - 1/a)\ V_0$ and $(1 - 2/a)V_0$, voltages of V_0 and zero and voltages of $1/a\ V_0$ and $(1 - 1/a)V_0$ are applied to the scanning line in the selected state of the liquid crystal dot and in the non-selected state thereof respectively, V_0 being a voltage exceeding a threshold value to excite the liquid crystal dot into illumination, a meeting a condition of $a > 3$, and the voltages of zero and $2/aV_0$, the voltages of V_0 and $(1 - 2/a)V_0$, the voltages of zero and $2/aV_0$ and the voltages of V_0 and $(1 - 2/a)V_0$ being applied to the signal line at the application of the voltage of V_0, the voltage of zero, the voltage of $1/aV_0$ and the voltage of $(1 - 2/a)V_0$ to the scanning line respectively.

3,995,943

ALL SOLID ELECTROCHROMIC DISPLAY

Raymond Joseph Jasinski, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

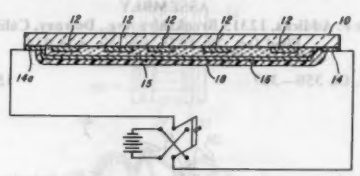
Filed Oct. 6, 1975, Ser. No. 619,734
Int. Cl.² G02F 1/36
U.S. Cl. 350—160 R **10 Claims**

1. An electrochromic display cell comprising:

a display electrode comprised of an oxide of tungsten or vanadium,

a counter electrode of an electronically conductive material taken from the group consisting of metallic silver and a silver-containing compound,

a solid electrolyte contacting both electrodes, said electrolyte comprising a mixed inorganic silver salt including a silver iodide, and



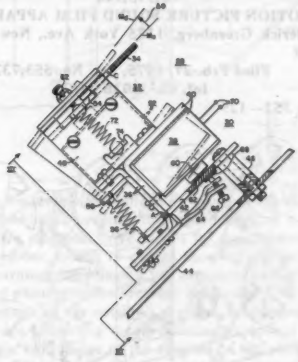
hermetic sealing means, including a transparent front panel through which said display electrode is visible when activated, forming a hermetically sealed enclosure within which said display electrode, said counter electrode and said solid electrolyte are disposed.

3,995,944

DIGITAL LINE-OF-SIGHT DEFLECTION CONTROL DEVICE

Paul J. Queeney, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1975, Ser. No. 554,274
Int. Cl.² G02B 5/08, 7/18
U.S. Cl. 350—285 **10 Claims**



1. Apparatus for controlling angular deflection of a line-of-sight (LOS) axis in each of two predetermined mutually orthogonal directions of deflective sweep, said apparatus comprising:

a. a series of mirrors, each pivotally mounted for movement about first and second orthogonally related linear pivot axes which constrain the mirrors to deflect the LOS axis in one and the other, respectively, of said two mutually orthogonal directions of deflective sweep,

b. the mirrors of the series of mirrors being s. arranged to define an LOS axis path composed of path segments reflected from one to another of successive mirrors of the series, and

c. each mirror of said series having operatively connected thereto a means for selectively driving the mirror between any one to any other of four predetermined positions, said four predetermined positions consisting of combinations of two predetermined pivotal deflection positions about

the first linear pivot axis of the mirror and two predetermined pivotal deflection positions about the second linear pivot axis of the mirror.

3,995,945

AXLE ADJACENT MOUNTED BICYCLE MIRROR ASSEMBLY

Lyle F. Addicks, 12313 Brookshire Ave., Downey, Calif. 90242

Filed Oct. 20, 1975, Ser. No. 625,014
Int. Cl.² G02B 5/10
U.S. Cl. 350—307 15 Claims

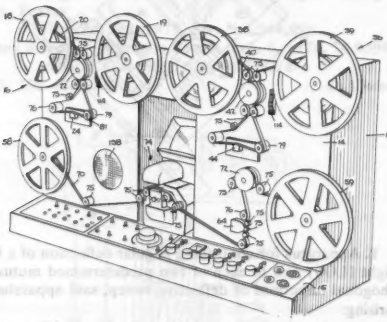
1. In combination:
a bicycle comprising a frame including a rotatable front fork having spaced arms, and wheels including a front wheel positioned between and rotatably mounted on said fork arms, and
a rear view mirror assembly mounted on one of said fork arms close to the front wheel axis including a mirror reflector disposed laterally outboard of said fork.

3,995,946

MOTION PICTURE SOUND FILM APPARATUS

A. Frederick Greenberg, 1175 York Ave., New York, N.Y. 10021

Filed Feb. 27, 1975, Ser. No. 553,732
Int. Cl.² G03B 21/00
U.S. Cl. 352—129 10 Claims



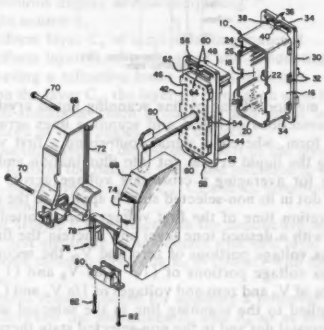
1. A motion picture sound film apparatus for editing, mixing and dubbing comprising:
a first multi-track tape recording and play back mechanism including first and second reversible feed/take-up reels and first recording and play back head,
a second tape recording and play back mechanism including third and fourth reversible feed/take-up reels and second recording and play back head,
a film viewing mechanism including fifth and sixth reversible feed/take-up reels, a third recording and play back head, and projection means for projecting the impage of film being fed between said fifth and sixth reels,
first, second, third, fourth, fifth and sixth variable speed motor means mechanically coupled respectively to said first, second, third, fourth, fifth and sixth reels, each of said motor means providng a continuous unidirectional torque to the respective one of said reels with which it is associated,
first, second and third reversible sprocket drives associated respectively with said first tape mechanism, said second tape mechanism and said film mechanism to control the direction and speed of the media fed between said reels associated with each of said mechanisms,
said three sprocket drives being coupled to each other to drive said media in synchronism on a frame by frame basis,
said motors maintaining tension on the media throughout the transport of whatever media is fed between the ones of said reels with which said motors are associated,
said first recording and play back head having at least first and second sound channels to separately record on and play back from first and second tracks of whatever tape is fed past said first head,
cueing means to provide cueing signals on said first track,
said third head having at least one sound channel to record on and play back from whatever recording stripe is included on whatever film is fed between said third feed reel and said third take-up reel, and
mixer means to selectively record on any of said sound recording channels the sound material being read on any one or more others of said sound recording channels.

3,995,947

ELECTRICAL CONNECTOR ASSEMBLY

Linn Stephen Lightner, Camp Hill, and Edwin Oscar Classon, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 31, 1975, Ser. No. 545,963
Int. Cl.² H01R 13/58; H02B 1/02
U.S. Cl. 339—92 M 15 Claims



1. An improved electrical connector assembly having both a receptacle member and a plug member, at least one of which has means for detachably mounting in a profiled aperture in a panel or the like, said plug member and said receptacle member each including a body portion with a plurality of bores extending therethrough to a mating face, a plurality of matable electrical contact terminals mounted in respective pairs of said bores and carried by said members into intermating engagement,
said means for detachably mounting comprising:
a radially directed flange extending integrally from said body portion of said one of said members;
first and second biasing bars spanning portions of said flange on opposite sides of said body, each said biasing bar having a substantially centrally located lug extending from both sides thereof in a direction normal to the plane of said flange;

a latching bar spanning a portion of said flange and having integral lugs substantially centrally located thereon and extending from both sides thereof in directions normal to the plane of said flange, said latching bar parallel to one of said biasing bars and spaced inwardly thereof towards said body portion;

a plurality of locking lugs integral with said body and spaced from said flange,

whereby said member is mounted on said panel by insertion of said body into said profiled aperture until said flange abuts said panel and said locking lugs lie behind said panel, said biasing bars being deformed by engagement of their respective lugs with said panel, said member then being moved in the plane of said panel until said latching bar lug projects into said aperture and said locking lugs are displaced with respect to said profiled aperture thus securing the member in place.

3,995,948

PHASE MASK FOR USE IN HOLOGRAPHIC APPARATUS

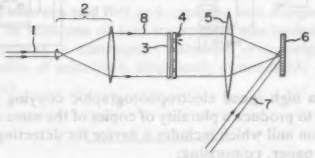
Michiharu Abe; Akiyoshi Oride, and Fusakichi Okouchi, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1975, Ser. No. 572,282

Claims priority, application Japan, May 1, 1974, 49-48318

Int. Cl.² G03H *1/16*; G02B *5/02*

U.S. Cl. 350—3.5 12 Claims



1. In a holographic apparatus for forming a Fourier transform hologram, the combination comprising:

coherent light source means for producing an illuminant beam and a reference beam;

means for producing a magnified collimated beam;

a phase mask and a two-dimensional transparent object serving as a data mask disposed in said illuminant beam;

optical means, including a Fourier transform lens, for producing an interference pattern between the light beam from said object and said reference beam at a Fourier transform plane defined by the focal point of said Fourier transform lens;

a hologram recording material located near the Fourier transform plane so as to form a Fourier transform hologram thereon;

wherein said phase mask comprises a transparent plate having a surface provided with random undulations by coating, by means of a spinner coater, with a solution of a high molecular weight compound selected from the group consisting of hydrogenated rosin ester, rosin ester, polyvinyl alcohol and polystyrene.

3,995,949

LIQUID CRYSTAL DISPLAY DEVICE OF INCREASED LIFE EXPECTANCY

Shuji Maezawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

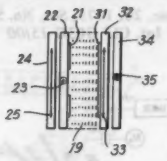
Filed July 31, 1974, Ser. No. 493,351

Claims priority, application Japan, July 31, 1973, 48-86190

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC 4 Claims

1. A field effect system liquid crystal display device using a twisted nematic mode, comprising two opposing transparent base plates, each having at least one transparent electrode on the inner surface thereof, nematic liquid crystals between said base plates, said liquid crystals making contact with said base plates, each of said inner surfaces being unidirectionally oriented and the liquid crystals proximate each inner surface



being oriented thereby, a pair of polarizers between which are positioned said base plates, the transmission axis of each polarizer being perpendicular to the orientation of the inner surface of the nearer of said base plates.

3,995,950

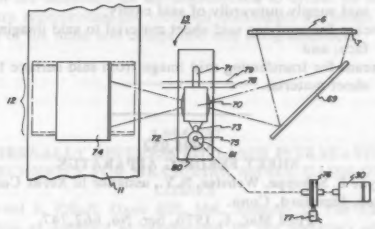
EXPOSURE SYSTEM FOR ELECTROSTATIC MACHINES

Robert H. Townsend, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1975, Ser. No. 549,588

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R 9 Claims



1. In a reproduction machine for producing selectively one or more copies of an original, the combination of: a movable photosensitive member; drive means for moving said photosensitive member, means to charge the photosensitive member in preparation for imaging; an exposure station whereat said charged photosensitive member is adapted to be exposed to a light image of the original; a platen for supporting the original; image projecting means forming an optical path for transmitting a light image of the original on the platen to the exposure station and the photosensitive member to form a latent elctrostatic image of the original on said member;

relatively low power flash illumination means adapted when triggered to illuminate the platen and the original thereon to form each time said flash illumination means is triggered a light image of said original for transmittal to said exposure station by said image projecting means;

optical path displacing means to displace the optical path formed by said image projecting means conjointly with said photosensitive member and in substantial parallelism with said photosensitive member at said exposure station, and

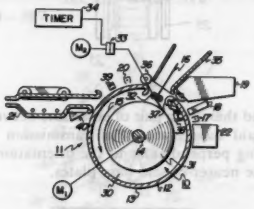
control means to trigger said flash illumination means at least twice for each copy of an original to be made and actuate said optical path displacing means to thereby project at least two full frame overlapping exposures of the original onto said photosensitive member, said overlapping exposures together forming said latent electrostatic image of the original.

3,995,951

SHEET FEEDING APPARATUS AND REPRODUCING MACHINE

David N. Hawkins, Victor, and Thomas Acquaviva, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,280
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 15 Claims



1. In a sheet feeding apparatus for a reproducing machine including a movable member having an imaging surface on its outer periphery and a supply of sheet material, the improvement wherein:

said movable member includes a cavity and wherein said supply of sheet material is supported within said cavity;

and wherein said apparatus further includes: means for forming at least one image on said surface;

means for feeding a desired length of sheet material from said supply outwardly of said cavity;

means for applying said sheet material to said imaging surface; and

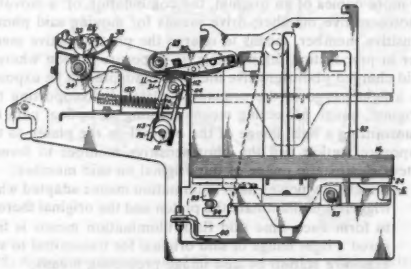
means for transferring said image from said surface to said sheet material.

3,995,952

SHEET FEEDING APPARATUS

Wayne F. Schoppe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,747
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 9 Claims



1. A sheet feeding apparatus comprising:

friction retard means for feeding sheets from a stack thereof, said feeding means including a feed member for engaging said stack and a retard member having a friction surface arranged to engage said feed member to form a nip through which said sheets are fed;

means for supporting said stack of sheets for movement between at least one elevated position and a lowered position;

means for selectively driving said stack support means to said elevated position;

means responsive to the operation of said selective driving means for incrementally moving said retard member relative to said feed member;

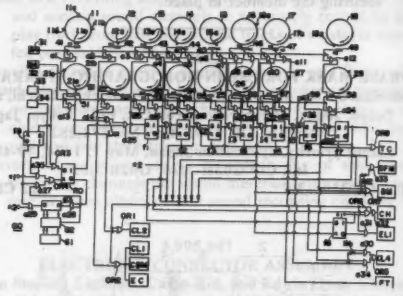
whereby upon movement of said retard member a different portion of said friction surface engages said feed member.

3,995,953

ELECTROPHOTOGRAPHIC APPARATUS

Yoshihisa Kawai, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,941
Claims priority, application Japan, Oct. 30, 1973, 48-122520; June 26, 1974, 49-73561
Int. Cl.² G03G 15/26
U.S. Cl. 355—14 5 Claims



4. In a high speed electrophotographic copying apparatus adapted to produce a plurality of copies of the same original in succession and which includes a device for detecting jamming of copy paper, comprising;

means for feeding lengths of copy paper one by one in succession along a copy paper path in timed relatiion so that a plurality of lengths of copy paper are present on the copy paper path simultaneously in spaced relation,

a plurality of copy paper detecting means provided at positions spaced along said copy paper path and responsive to arrival of a copy paper for generating a first signal,

a plurality of timer means, one associated with each of said detecting means for generating a second signal indicative of time by which the copy paper should arrive at a corresponding detecting means,

a plurality of jam determining means associated with respective detecting means and timer means for detecting generation of said first signal prior to generation of said second signal,

a plurality of shifting means associated with the respective jam determining means and said feeding means for shifting to the next jam determining means when no jamming occurs and for stopping operation of said feeding means if the copy paper fails to arrive at one of said detecting means within a time defined by said corresponding timer means.

3,995,954

EXPOSURE SYSTEM

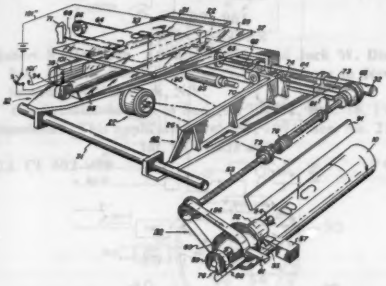
Gary A. Dir, 16 Gateway Road, Fairport, N.Y. 14450, and Charles J. Urso, 1130 Wall Road, Webster, N.Y. 14580, assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1975, Ser. No. 617,136
Int. Cl.² G03B 27/76
U.S. Cl. 355—71 3 Claims

1. An exposure system for reflex imaging in a copying machine, comprising:

a. a stationary viewing platen for supporting an original in a plane, said platen defining a first side margin boundary and an opposing side margin boundary;

b. a lamp positioned to direct light towards said first side margin boundary;
c. means for receiving light reflected from said original and focusing said light upon an imaging member; and
d. means for selectively varying the intensity of the light focused upon said imaging member; said means for varying the intensity of focused light being located in the field of light emission from said lamp and comprising: a light



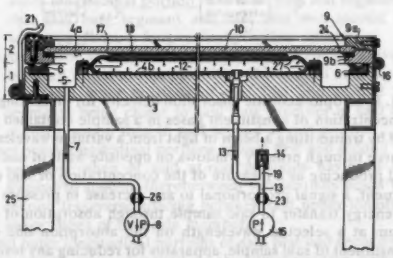
scattering liquid crystalline composition sandwiched between two transparent electroded surfaces, said means for varying the intensity of focused light further including an arcuate reflective surface adapted to reflect emitted light between said first and opposing side margin boundaries, at least one of said transparent electroded surfaces comprising a transparent substrate overcoated with a plurality of selectively electrically connectable electrode stripes.

3,995,955

PRINTING FRAME

Dieter Töpfer, Wiesbaden-Biebrich, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Apr. 28, 1975, Ser. No. 572,085
Claims priority, application Germany, Apr. 30, 1974, 7415237[U]
Int. Cl.² G03B 27/20
U.S. Cl. 355—91 **5 Claims**



1. In a printing frame for the exposure of printing plates comprising two closable components, flexible sheet means secured to one of said components and being adapted to press a printing plate and an original together and maintain them in close contact during exposure, and

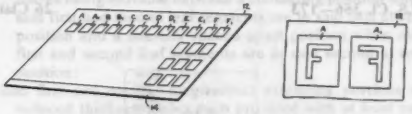
means for exerting air pressure on said flexible sheet means in order to press said printing plate and original together, the improvement comprising sack means formed by said flexible sheet means, and conduit means connected to the sack.

3,995,956

MICRORECORD HAVING MIRROR-IMAGES

Adnan Waly, Stamford, Conn., assignor to Personal Communications, Inc., Stamford, Conn.

Filed Feb. 15, 1974, Ser. No. 443,028
Int. Cl.² G03B 27/42
U.S. Cl. 355—133 **2 Claims**



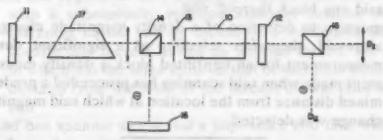
1. A microrecord whose reduced scale images may be selectively projected for viewing by an observer or for copying without the use of an image-reversing mirror, said microrecord comprising a common carrier having formed thereon a main set of images each being a photograph in a reduced scale of a document or other form of intelligence, and a companion set of images displaced from the main set of images, each companion image being the mirror image of the corresponding photograph in the main set, whereby a selected main image may be viewed by aligning it with an optical system to project it onto a screen and the corresponding companion image may be copied onto a sensitive film by shifting the microrecord relative to said optical system to align said corresponding companion image therewith, each image in the main and companion sets being dissected into bits or characters which are dispersed on the microrecord to create an image pattern representing the recorded document, the image patterns of the main and companion sets being interlaced.

3,995,957

INTERNALLY REFERENCED, LASER INTRACAVITY TECHNIQUE FOR MEASURING SMALL GAINS OR LOSSES

Herschel S. Pilloff, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1975, Ser. No. 623,143
Int. Cl.² G01N 21/40; H01S 3/00
U.S. Cl. 356—114 **3 Claims**



1. A method for measuring small gain or losses in a laser cavity; which comprises:

operating the laser simultaneously at one wavelength but with a perpendicular polarized and a horizontally polarized radiation beams;
directing each polarization to separate detectors;
determining the ratio of the radiation intensities detected at each detector with a sample cell in the horizontal polarized beam;
placing a desired material within said sample cell, and determining the ratio of the radiation intensities with the material in the cell to determine any increase or decrease in the ratio;
wherein an increase in the ratio indicates a gain and a decrease indicates a loss.

3,995,958

AUTOMATIC DENSITOMETER AND METHOD OF COLOR CONTROL IN MULTI-COLOR PRINTING

Kurt A. Pfahl, Leawood, Kans.; Richard A. Robinson, Parkville, Mo., and Craig Ritchie Brougher, Prairie Village, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed July 21, 1975, Ser. No. 597,928
Int. Cl.² G01J *3/46*
U.S. Cl. 356—173 **26 Claims**

1. In a method for obtaining color density data for a work piece printed in a selected number of a predetermined set of colors from an elongate control strip imprinted on said work piece and containing aligned blocks imprinted in each of said number of colors and arranged in cyclic order according to colors along the linear length of said strip:

making repeated measurements of color density at successive locations along said control strip at intervals such that a plurality of such measurements will be made in respect of each block of said strip while continuously scanning the length of said strip;

detecting a change in the magnitude of a pair of successive density measurements of sufficient extent to indicate a transition during scanning of the locations of said pair of successive measurements between an area of said strip included in one of said blocks thereof and an adjacent area of said strip of color characteristics different from said one block thereof; and

responsive to detection of a density magnitude change as aforesaid, thereafter selecting as a significant density measurement for an imprinted block a density measurement made when said scanning has proceeded a predetermined distance from the location at which said magnitude change was detected.

3,995,959

METHOD AND APPARATUS FOR DETERMINING THE OPERATIONAL STATUS OF A PHOTOGRAPHIC FILM PROCESSOR

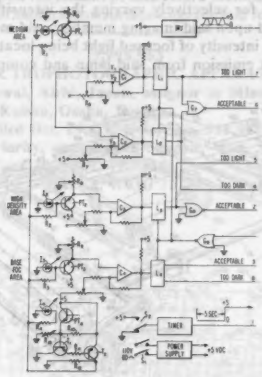
Gary S. Shaber, 326 Saybrook Road, Villanova, Pa. 19085

Filed Apr. 21, 1975, Ser. No. 570,217
Int. Cl.² G01N *21/06*
U.S. Cl. 356—202 **10 Claims**

5. An apparatus for determining the status of a processor of photographic film, upon which film a test pattern has been exposed under calibrated conditions to produce, upon development, at least a dark or high density area, an area of middle density, and an unexposed base fog area, comprising;

a. densitometer means to measure the density of the test film in said high density area, said medium density area, and said base fog portion of the film;

b. comparator means to compare the output of the densitometer to threshold outputs for each of the three areas under nominal conditions; and



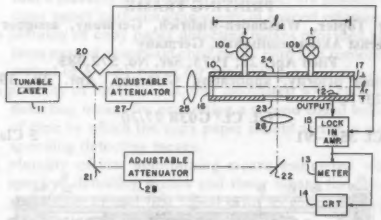
c. digital logic circuit means to operate upon the outputs of said comparator means to produce outputs indicative of the operational status of said film processor.

3,995,960

METHOD AND APPARATUS FOR BACKGROUND SIGNAL REDUCTION IN OPTO-ACOUSTIC ABSORPTION MEASUREMENT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Lars-Göran Rosengren, Kungsbacka, Sweden

Filed July 25, 1975, Ser. No. 599,284
Int. Cl.² G01J *3/42*; G01N *21/24*
U.S. Cl. 356—204 **10 Claims**



1. In an opto-acoustic absorption detector for measuring the concentration of constituent gases in a sample contained in a cell by transmitting a beam of light from a variable wavelength source through primary windows on opposite walls of said cell and producing as a measure of the concentration of said constituent, a signal proportional to any increase in pressure due to energy transfer to said sample through absorption of said beam at a selected wavelength on the absorption line of a constituent of said sample, apparatus for reducing any residual background signal produced as a result of an increase in pressure due to energy transfer to said sample through absorption by said windows comprising

a second set of windows on opposite walls of said cell for passing a beam through said cell in a path of a length different from the path between said primary windows,

means for alternately directing said beam of light through said primary windows and said second set of windows,

means for adjusting the relative power of said beam in said two paths for minimum absorption pressure difference indicated by said signal when said beam is selected to be

away from the absorption lines of constituents of said sample, and

means for displaying the absorption pressure difference indicated by said signal for a selected wavelength of said beam as a measure of the concentration of a constituent in said sample when the wavelength of said beam selected is on the absorption line of said constituent.

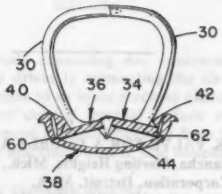
3,995,961
RING BINDER

Robert S. Dorfman, Atlantic Beach, and Jack W. Dorfman, East Atlantic Beach, both of N.Y., assignors to Jerome S. Serchuck, Great Neck, N.Y.

Continuation-in-part of Ser. No. 12,352, Feb. 18, 1970, abandoned. This application Dec. 27, 1971, Ser. No. 212,339

Int. Cl.² B42F 3/04

U.S. Cl. 402—38 7 Claims



1. A ring binder comprising a one piece body including a stationary base segment and first and second leaf segments,

said base segment including a pair of spaced apart longitudinal side members extending upwardly from opposite longitudinal ends of a base member of said base segment.

a first longitudinally extending portion of reduced thickness being integrally hingedly connected between an upper longitudinal portion of one of said side members and an outer longitudinal portion of said first leaf segment,

a second longitudinally extending portion of reduced thickness being integrally hingedly connected between an upper longitudinal portion of the other of said side members and an outer longitudinal portion of said second leaf segment,

a third longitudinally extending portion of reduced thickness being integrally hingedly connected between an inner longitudinal portion of said first leaf segment and an inner longitudinal portion of said second leaf segment so that said base segment and said first and second leaf segments define a longitudinally hollow spine,

said first and second leaf segments being vertically movable between a first at-rest position and a second at-rest position, said inner portions of said first and second leaf segments being closer to said base member in said first at-rest position than in said second at-rest position,

said outer longitudinal portions of said first and second leaf segments when in said at-rest positions having a first transverse spacing therebetween substantially equal to a second transverse spacing between said upper longitudinal portions of said side members,

said outer longitudinal portions of said first and second leaf segments when disposed in any other position between said at-rest positions having a third transverse spacing therebetween substantially equal to a fourth transverse spacing between said upper longitudinal portions of said side members,

said base segment being at least partially elastic laterally to allow outward movement of said upper longitudinal portions of said side members from said second transverse spacing to said fourth transverse spacing,

said third transverse spacing between said outer longitudinal portions of said first and second leaf segments being greater than said second transverse spacing between said upper longitudinal portions of said side members to effect a toggle-like joint limiting said first and second leaf segments to either one of first and second at-rest positions,

each of said first and second segments having at least one ring half integrally formed therewith, said one ring half on said first leaf segment being correspondingly disposed in confronting relationship with said one ring half provided on said second leaf segment, said corresponding ring halves being movable between a contacting position when said first and second leaf segments are in said first at-rest position and a laterally spaced apart position when said first and second leaf segments are in said second at-rest position;

said first and second longitudinal extending portions of reduced thickness being each provided with at least one longitudinal slot therethrough in order to enhance the ease with which said first and second leaf segments are movable between said first and second at-rest positions.

3,995,962
BUILDING KIT FOR THE PRODUCTION OF THREE-DIMENSIONAL FRAMEWORKS

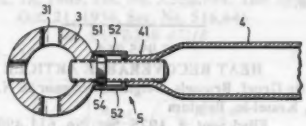
Armin Mylaeus, Haydnstrasse 10, 597 Plettenberg, Germany

Filed June 3, 1975, Ser. No. 583,489

Claims priority, application Germany, June 4, 1974, 2426973

Int. Cl.² F16B 7/00

U.S. Cl. 403—47 2 Claims



1. A building kit for the production of three-dimensional frameworks comprising:

a ball-shaped joint having threaded joint bores;

integral-formed tube-shaped rods having end regions;

coupling means provided at said rod end regions for threaded connection of said rods with said bores of said joints, said coupling means each comprises a bolt provided at both ends with bolt threads of a same sense and of a different pitch and a box spanner sleeve axially displaceable yet non-rotatably disposed thereon;

said end regions of said integrally formed rods are formed with a substantially reduced diameter relative to the thickness of the rod by means of a bottleneck-shaped constriction thereof having an internal thread, the pitch of which has the same sense as that of said joint bores and deviates from the pitch of the threads of said joint bores; and

said box spanner sleeve has a joint-sided end face which is formed concave.

3,995,963
SLIDING ARM LOCK ASSEMBLY

Kenneth C. Mosley, Grand Rapids, and Clare E. Barkalow, Comstock Park, both of Mich., assignors to Michigan Instruments, Inc., Grand Rapids, Mich.

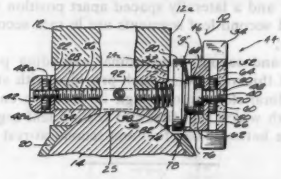
Filed Feb. 18, 1975, Ser. No. 550,602

Int. Cl.² F16B 7/10; F16D 1/12

U.S. Cl. 403—104 17 Claims

1. An arm lock assembly for securing an arm to a post comprising, in combination: a locking member having a configurated seat for clamping engagement with the post; a shaft threaded axially through said locking member and having at least one end extending beyond said locking member; a handle means secured to said one end of said shaft for rotating said

shaft causing relative axial displacement between said shaft and locking member; spring means cooperative with said handle means and cooperatively engaging with the arm to produce a clamping force between said locking member and the post, said spring means yielding as the clamping force increases between said locking member and the post; and brake means engaged by said handle means and cooperatively engaging with the arm and limiting further tightening of said lock assembly when a predetermined level of tightness is



reached, said spring means is a conical washer mounted on said shaft, said conical washer adapted to deflect as said lock assembly is tightened and thereby increasing the clamping force between said locking member and the post, and wherein said handle means includes a hub with a portion thereof extending beyond said conical washer and having a diameter exceeding that of said conical washer, said hub comprising said brake means and restricting further deflection of said conical washer when said predetermined level of tightness is reached.

3,995,964

HEAT RECOVERABLE ARTICLE

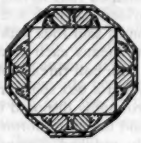
Pierre De Groef, Brussels, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Sept. 8, 1975, Ser. No. 611,490

Claims priority, application United Kingdom, Sept. 6, 1974, 39125/74

Int. Cl.² H02G *15/08*

U.S. Cl. 403—272 **19 Claims**



13. An article comprising:

a. A heat shrinkable outer tubular member having at least one open end and

b. An inner spacer member, said spacer dividing the interior of the tubular member into a plurality of longitudinal compartments adapted to receive an elongate substrate, wherein said spacer has the cross-section of a regular polygon.

3,995,965

ROAD SURFACE DEICING DEVICE

Steven M. Cox, Brownsburg, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1976, Ser. No. 672,159

Int. Cl.² E01H *5/10*

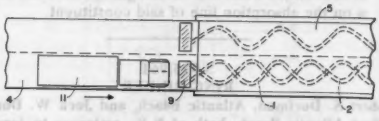
U.S. Cl. 404—71 **4 Claims**

1. A road surface deicing device, comprising

fluid ducts at the surface of a road;

a heating system including the fluid ducts and heating fluid for deicing the road surface when circulating through the ducts; and

pump means for circulating the heating fluid through the fluid ducts to deice the road surface, said pump means comprising a fluid pump housed beneath the surface of the road and coupled to the fluid ducts, said fluid pump having a piston and an actuator plate coupled to the



piston, said actuator plate being pivotally mounted at the surface of the road in a manner whereby the weight of a vehicle passing over said actuator plate operates the pump means to circulate the heating fluid through the fluid ducts.

3,995,966

CHECK VALVE FOR A DOUBLE ACTION PUMP

Erwin B. Biancha, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,548

Int. Cl.² F04B *3/00, 7/04, 39/10*

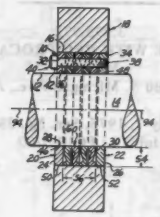
U.S. Cl. 417—254 **2 Claims**

1. An improvement in a double action reciprocating piston pump having a reciprocable piston operatively disposed in two pump chambers, a primer chamber, valve means for controlling flow from said primer chamber to one of said pump chambers and a check valve for controlling the flow between the chambers wherein said check valve moves in a direction opposite to the movement of the piston of said pump when opening or closing to control flow; the improvement comprising; a free floating check valve means for controlling flow from one pump chamber to the other pump chamber when the one pump chamber is pumping and for providing substantially free flow between the chambers when the other chamber is pumping, said check valve having an inner cylindrical surface encircling the pump piston and being spaced therefrom by a diametral clearance of 0.035 to 0.085 inches and an outer cylindrical surface having a clearance with the inner wall of said pump, and valve plate means adjacent one side of said check valve means and cooperating therewith for controlling flow and having an inner cylindrical surface in close sliding fit with said piston for scraping foreign matter from said piston as piston is reciprocating and port means radially outward of the inner cylindrical surface thereof for providing a split flow to the inner and outer cylindrical surfaces of said check valve means.

3,995,967
SIMULTANEOUSLY EXPANDING AND CONTRACTING ANNULAR COUPLING DEVICE

John Haller, Triesen, Liechtenstein, assignor to Michigan Powdered Metal Products, Inc., Livonia, Mich.

Filed Aug. 13, 1975, Ser. No. 604,479
Int. Cl.² F16D 1/06
U.S. Cl. 403—370 9 Claims



1. A simultaneously expanding and contracting annular coupling device for drivingly connecting the circular-cross-section external surface of an inner machine element with the circular-cross-section coaxial internal surface of an outer machine element spaced annularly outward from the external surface of the inner machine element, said coupling comprising

a forward annular clamping member,

a rearward annular clamping member disposed in coaxial spaced relationship with said forward annular clamping member,

a plurality of annular coupling members of resiliently deformable material disposed in the annular space between said clamping members in coaxial engagement with said clamping members and with one another,

said clamping members and said coupling members being constructed and arranged to enter and to loosely fit the annular space between the external surface of the inner machine element and the internal surface of the outer machine element,

each of said coupling members being of substantially Z-shaped cross-section with an annular inner rim and an annular outer rim spaced outward from said inner rim and with an annular web interconnecting said rims and extending therebetween obliquely to the axis of said coupling member,

said rims extending generally parallel to the axis of said coupling member and in opposite directions from said web and at acute angles thereto,

and means for compressing said coupling members axially between said clamping members with consequent deformation of said oblique webs toward more nearly radial positions, and thereby simultaneously moving said inner and outer rims radially in opposite directions into frictional coupling engagement with said inner and outer machine elements.

3,995,968
TURBINE ROTOR DISC HAVING ULTRASONIC INSPECTION SURFACE THEREON

George T. Campbell, Jr., Swarthmore, and Thomas P. Sherlock, Lansdowne, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

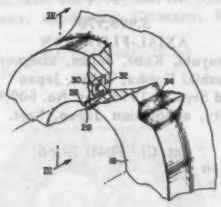
Filed Dec. 24, 1974, Ser. No. 536,069
Int. Cl.² F16D 1/08; G01N 23/02
U.S. Cl. 403—356 3 Claims

1. A rotor for an axial flow turbine apparatus comprising:

a shaft member,

a disc member mounted on said shaft member,

a key disposed between said disc and said shaft, said disc having a flat surface externally thereon capable of operably receiving a detector, said flat surface on said disc being disposed substantially parallel to a predetermined expected plane of fracture within the disc so that an

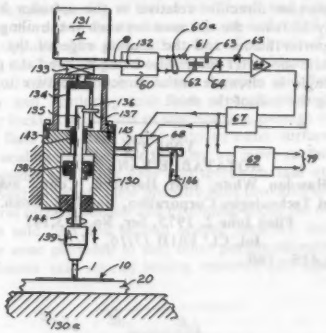


ultrasonic signal emitted from said detector mounted against said flat surface propagates through said disc in a direction substantially perpendicular to said plane which also normally extends longitudinally through said key.

3,995,969
FLAT CIRCUIT INSULATION STRIPPING APPARATUS

Lawrence T. Fleming, 625 S. Oak Knoll Ave., Pasadena, Calif. 91106

Continuation-in-part of Ser. No. 350,888, April 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 71,447, Sept. 11, 1970, abandoned, which is a division of Ser. No. 768,860, Oct. 18, 1968, Pat. No. 3,555,964. This application Oct. 21, 1974, Ser. No. 516,646
Int. Cl.² B23B 47/18
U.S. Cl. 408—12 5 Claims



1. An insulation stripping apparatus for a flat flexible electrical circuit workpiece of soft metal foil conductors laminated between sheets of insulating film, comprising:

a rotatable cutting tool having a generally cylindrical body portion and sharp cutting lips extending transversely across its end portion and each being inclined convexly to a normal to the axis of said body portion at an angle between 0° and 1° and having a rake angle between about 0° and 8° negative,

said tool requiring a first value of feed force to cut into said insulating film and a second, larger value to cut into said foil,

said second value being at least about twice said first value,

a machine having a rotary spindle, means for driving said spindle, and chuck means driven by said spindle to rotate said tool;

feed means for imparting a feed stroke to said spindle,

force-sensing means to sense said feed force and translate it into another analogous variable quantity, and

means to limit said feed force to a value between said first

and second values so that the force is sufficient to permit said tool to cut through said insulating film but insufficient to cut substantially into the underlying metal foil, said tool merely burnishing the foil which it has exposed.

3,995,970

AXIAL-FLOW FAN

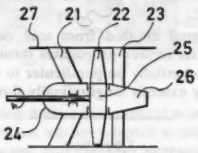
Yamaguchi Nobuyuki, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1975, Ser. No. 609,913

Claims priority, application Japan, Sept. 10, 1974, 49-108917[U]

Int. Cl.² F04D *29/66*

U.S. Cl. 415—119 **1 Claim**



1. An axial flow fan comprising within a casing stator blades, supporter blades and actuator blades, the latter being intermediate said stator and supporter blades and being mounted therebetween for rotation by a shaft, said supporter blades being upstream, relative to the direction of gas flow, of said stator and actuator blades, and for reducing noise created by wakes resulting from gas passage past said supporter blades to said actuator blades, the supporter blades have leading and trailing edges inclined from their roots to their tip ends in an axial upstream direction relative to the actuator blades to gradually increase the distance between the trailing edge of the supporter blades and the leading edge of the actuator blades, said supporter blades also being inclined at a predetermined angle in circumferential direction relative to a plane including the axis of the shaft.

3,995,971

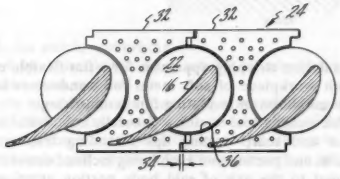
ROTATABLE VANE SEAL

Loren Hawdon White, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 2, 1975, Ser. No. 583,141

Int. Cl.² F01D *17/16, 17/14*

U.S. Cl. 415—160 **2 Claims**



1. In a gas turbine engine having an annular flow path for the working medium gases which extends through the turbine section of the engine and having a cooling air chamber located radially outward of the flow path, apparatus for preventing excessive leakage of cooling air from the chamber into the flow path, which comprises:

a plurality of segments supported between the annular flow path and the chamber in side to side relationship wherein said segments are contoured to form a cylindrical aperture between each pair of adjacent segments;

a plurality of turbine vanes, each having a cylindrical platform which is rotatably mounted within one of the cylindrical apertures between adjacent segments;

a split ring abutting each cylindrical aperture and the corresponding platform of the vane mounted therein; and

a spring member comprising a section of convoluted tubing operatively disposed to urge said ring against the aperture and the corresponding platform to prevent the leakage of cooling air therebetween as differential component growths during operation of the engine cause ovalization of said aperture.

3,995,972

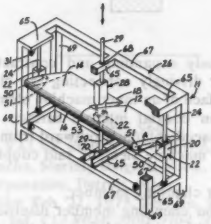
WIND MACHINE WITH RECIPROCATING BLADE MEANS

Esam M. Nassar, 3100 S. Michigan Ave., Apt. 402, Chicago, Ill. 60616

Filed July 7, 1975, Ser. No. 593,526

Int. Cl.² F03D *5/00*

U.S. Cl. 416—68 **9 Claims**



1. A reciprocating wind apparatus comprising

a support,

a carrier guided for reciprocating movement on said support,

at least one elongated blade having a longitudinally extending axis and a leading longitudinally extending edge for facing the wind, pivot means on said carrier pivotally mounting said blade for free turning by the wind about said longitudinal axis and relative to said carrier to present one side to the wind when driving said carrier in a first direction and to present the other side of said blade to the wind when driving said carrier in the opposite direction, a variable angle of attack of the blade being determined by the wind, means on said carrier limiting the maximum amount of turning of the blade by the wind about its longitudinal axis, and

means associated with said support for turning said blade about its longitudinal axis to present its opposite side to the wind and to cause a reversal in the direction of carrier travel.

3,995,973

VARIABLE DISPLACEMENT HYDRAULIC SYSTEM

Curtis Phillip Ring, and Raymond John Hemming, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

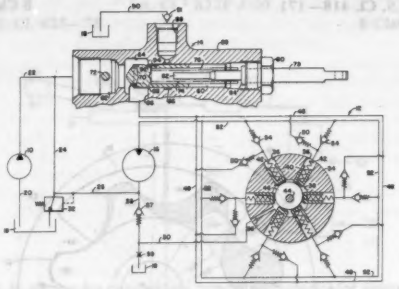
Filed Sept. 4, 1975, Ser. No. 610,234

Int. Cl.² F04B *1/04, 49/00*

U.S. Cl. 417—214 **18 Claims**

1. A hydraulic system comprising: a charge pump having an inlet in fluid communication with a reservoir and an outlet; a charge circuit in fluid communication with the charge pump outlet and including pressure limiting means maintaining a substantially constant fluid pressure in the charge circuit; a variable displacement pump including a drive chamber in fluid communication with the charge circuit, a plurality of cylinders each having one end open to the drive chamber and a second end connected to inlet means and outlet means, a piston reciprocally mounted in each cylinder, spring means in each cylinder biasing its respective piston toward the drive chamber with a force no greater than the force exerted on the pistons

by fluid pressure within the drive chamber, and drive means in the drive chamber for engaging the pistons to drive the pistons through discharge strokes; and control valve means interconnecting the charge circuit and the inlet means including varying means movable from a closed fluid blocking position through a first valving range in which it varies and controls the



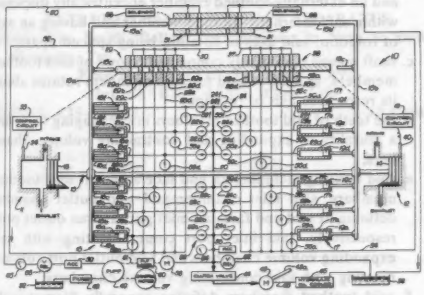
quantity of fluid flowing therethrough at flow rates within a first flow range and a second valving range in which it varies pressure drop of the fluid flowing therethrough at flow rates in a second flow range greater than the first range and maintains substantially constant any set pressure drop irrespective of variations in flow rates with the second flow range.

3,995,974

INTERNAL COMBUSTION ASSISTED HYDRAULIC ENGINE

Allen R. Herron, 17656 Orna Drive, Granada Hills, Calif. 91344

Filed Sept. 18, 1974, Ser. No. 506,992
Int. Cl.² F04B *49/00, 17/00*
U.S. Cl. 417—280 **15 Claims**



1. An internal combustion assisted hydraulic engine comprising:

an internal combustion chamber having a piston,

a set of at least two hydraulic cylinders each connected to said piston for pressurization during each power stroke of said chamber,

a common output line for pressurized hydraulic fluid from said set of cylinders, and

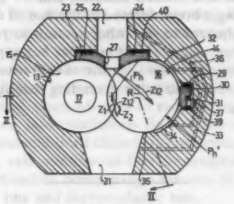
hydraulic load control means, responsive to the force exerted on said piston, for selectively disconnecting the hydraulic cylinders from said common output line during said chamber power stroke to maintain the hydraulic fluid pressure in said output line at a substantially constant preselected level notwithstanding changes in force exerted on said piston during said power stroke.

3,995,975

GEAR PUMP

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 18, 1975, Ser. No. 559,595
Claims priority, application Germany, Mar. 27, 1974, 2414760
Int. Cl.² F04C *29/00*
U.S. Cl. 418—74 **9 Claims**



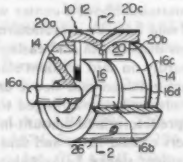
1. A gear pump comprising a pair of meshing gears, only one of which is provided with axial trunions; a housing having an inlet and an outlet and defining between said inlet and said outlet a chamber having inner peripheral cylindrical surface portions respectively engaging outer surfaces of the teeth of said gears, and opposite side faces in engagement with corresponding side faces of the gears; a pair of axially aligned bearing portions in said housing respectively receiving said trunions of said one gear for rotatably mounting said one gear, one of said trunions projecting beyond said housing for transmitting a torque to said one gear; a first sealing member arranged in said housing at the outlet thereof and subjected at one face thereof to fluid pressure in said outlet and engaging with an opposite face at least the other of said pair of gears for pressing the latter against a sealing zone provided at the inner peripheral surface of said chamber opposite said first sealing member and bordering said inlet; a single second sealing member located in a cavity of said housing; passage means for feeding fluid from said outlet onto an outer surface of said second sealing member for pressing an inner surface of the latter against said other gear and therewith said other gear against said one gear; a low pressure zone provided in an inner peripheral surface portion and extending about the other gear between said first and second sealing member; and a high pressure zone provided in said inner peripheral surface portion between said second sealing member and said sealing zone.

3,995,976

ROTARY DEVICE WITH AXIALLY BIASED BLADE AND ROTOR SECTIONS

Yutaka Ishizuka, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1975, Ser. No. 544,951
Claims priority, application Japan, Feb. 2, 1974, 49-13963
Int. Cl.² F01C *19/00;* F03C *3/00;* F04C *15/00, 27/00*
U.S. Cl. 418—110 **10 Claims**



1. In a fluid displacement device including a housing having

a bore, end walls to close the ends of said bore and fluid inlet and outlet ports, a rotor mounted for rotation within said bore and having a longitudinal groove, a blade fitted in said groove and substantially sealingly contacting the inner circumference of said housing, said rotor and blade being rotatable within said housing to displace fluid from said inlet to said outlet,

two longitudinal sections provided on said rotor;

a resilient member inserted between said two sections to urge said sections toward said respective end walls to sealingly contact therewith, said resilient member being in the form of a broken annulus; and

a recess having a break formed in the end of one of said two sections adjacent to the other section to retain the resilient member, said resilient member being provided in the recess in the end of said section of said rotor, said longitudinal groove of said rotor extending through the break in said recess.

3,995,977

VANE PUMP HOUSING

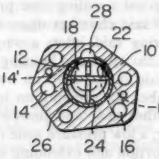
Koichi Takahasi, Yokohama; Nobuteru Hitomi, Yokosuka; Tokiyoshi Yanai, Yokosuka, and Manabu Tsunematsu, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Division of Ser. No. 399,716, Sept. 24, 1973, Pat. No. 3,877,127. This application Oct. 29, 1974, Ser. No. 519,032

Claims priority, application Japan, Sept. 28, 1972, 47-96642

Int. Cl.² F04C *5/00*

U.S. Cl. 418—153 **2 Claims**



1. A vane pump comprising:

a casing having therein a bore with a substantially circular profile and fluid inlet and outlet ports respectively communicating with said bore;

an annular resilient sleeve disposed in said bore so that the centers of said bore and said annular resilient sleeve are offset eccentrically, and having formed therein a pair of apertures respectively communicating with said inlet and outlet ports, said annular resilient sleeve having a wall thickness substantially uniform through the whole thereof;

a rotor rotatably disposed in said annular resilient sleeve and having a plurality of axial slots formed therein;

a plurality of vanes slidable in respective slots, said vanes protruding radially from said rotor so as to sealingly contact the inner wall of said annular resilient sleeve, said rotor being rotatable about a center which is offset from the center of said bore by a predetermined amount;

deforming means disposed in said casing to exert a deforming force inwardly on said resilient sleeve to increase the sealing contact between said sleeve and said vanes;

said deforming means being arranged to deform said resilient sleeve a predetermined amount in a plane containing the two centers of said rotor and said bore; and

said annular resilient sleeve being guided along the generally half peripheral cylindrical wall thereof by said circular profile of said casing.

3,995,978

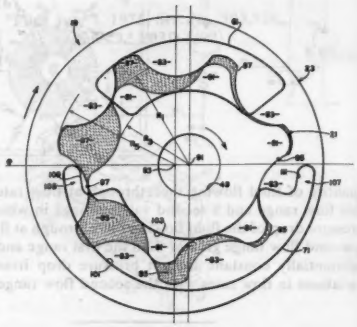
HYDRAULIC FLUID PRESSURE DEVICE AND PORTING ARRANGEMENT THEREFOR

Farooq A. Khan, and Leslie L. Ecklund, both of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 4, 1975, Ser. No. 565,033

Int. Cl.² F04C *15/02, 1/06*

U.S. Cl. 418—171 **8 Claims**



1. A hydraulic device comprising:

a. a housing defining an inlet chamber and an outlet chamber;

b. an internally-toothed member having an axis of rotation and an externally-toothed member eccentrically disposed within said internally-toothed member and having an axis of rotation, said axes of rotation being spaced apart;

c. shaft means operatively connected to one of said toothed members, as each of said toothed members rotates about its respective axis of rotation;

d. the teeth of said toothed members interengaging to define a plurality of expanding and contracting volume chambers;

e. said housing including an end face adjacent said toothed members, said inlet chamber and said outlet chamber defining at said end face, an inlet port and an outlet port, respectively, said inlet port communicating with said expanding volume chambers and said outlet port communicating with said contracting volume chambers;

f. said toothed members defining generally diametrically opposed first and second sealing points, said first sealing point separating the largest of said contracting and expanding volume chambers and said second sealing point separating the smallest of said contracting and expanding volume chambers; and

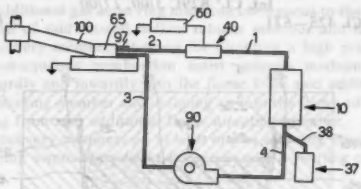
g. said inlet port being generally arcuate and extending circumferentially from adjacent said first sealing point to adjacent said second sealing point, said inlet port including a first terminal portion disposed adjacent said first sealing point to remain in fluid communication with the largest of said expanding volume chambers for several degrees of rotation of said internally-toothed member and said externally-toothed member after said largest of said expanding volume chambers begins to contract, to improve the inlet flow characteristics of the device.

3,995,979

APPARATUS FOR LUBRICATING MOULDS FOR BLANKS

Renzo Fedrigo, Banchette (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 1, 1974, Ser. No. 520,141
Claims priority, application Italy, Dec. 5, 1973, 70565/73
Int. Cl.² B22F 3/00
U.S. Cl. 425—78 8 Claims



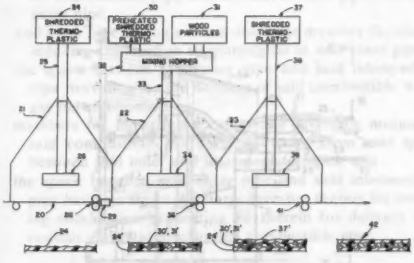
1. In a press for compacting powdered material for sintered parts of high density, comprising a mould and at least one plunger adapted to be actuated by a cyclic shaft to effect a preliminary compacting, an electrodynamic unit for the high density compacting and including an apparatus for lubricating the mould comprising a reservoir for mixing the lubricant with dry air, a corona charger connected to said reservoir for charging electrostatically the mixture of said lubricant and dry air, a distributor connected to said corona charger actuatable for injecting said mixture into said mould, means operative to maintain the mould at an electric potential such as to attract the lubricant and cause it to be deposited on the inside walls of the mould, an element carried by the said shaft for actuating said injecting distributor in a predetermined time relationship with respect to said compactings, and a recycling blower connected between said distributor and said reservoir so as to keep said mixture in circulation.

3,995,980

EXTRUDED PANEL PRODUCT APPARATUS

Teddy Van Smith, Dallas, Tex., assignor to Nora S. Smith, Mesquite, Tex.

Filed Oct. 28, 1975, Ser. No. 625,897
Int. Cl.² B29C 15/00; B29D 7/00
U.S. Cl. 425—131.1 18 Claims



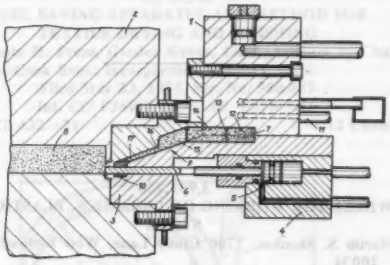
1. Apparatus for mechanically extruding a continuous running length of construction wall paneling from raw material sources, respectively comprising waste thermoplastic material and cellulose fiber material comprising a continuous conveyor means; said conveyor means comprising adjacent pivotably interconnected, interleaving, transversely-extending, plates to define a planar work surface of predetermined width and length, drive means for said conveyor means by means of which said working surface may be selectively advanced in a predetermined direction; first, second, and third, respectively, cascaded temperature-controlled oven chambers through which said working surface is sequetially advanceable; a material distribution means operable within the confines of each of said oven chambers, each said distribution means being connected to a continuously flowing one of said raw material sources, each said distribution means comprising material flow-directing means operable in concert with said conveyor means to spread an even flow of raw materials over that surface portion of said conveyor underlying the distribution means, during a predetermined time period, including a time period during which said conveyor means is advanced, with said material flow-directing means starting from a predetermined home position, and returning to same upon said conveyor completing a predetermined advance; pressure rolling means at the terminus end of each of said oven chambers through which said conveyor and the material on the surface thereof is passed, upon advance of said conveyor through said oven chambers; said continuous flow of raw material distributed in said first and third chambers comprising thermoplastic material bits; said continuous flow of material distributed in said second chamber, comprising a mixture of shredded cellulose material bits and thermoplastic bits.

3,995,981

FEEDHEAD DEVICE FOR THE MOULDING OF PLASTICS MATERIALS TO BE FORMED FROM A PLURALITY OF LIQUID CONSTITUENTS

Bernd Fries, Volkach, Germany, assignor to Messrs. Demag AG, Germany

Continuation of Ser. No. 288,584, Sept. 13, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,670
Claims priority, application Germany, Sept. 15, 1971, 2146181
Int. Cl.² B29F 1/06
U.S. Cl. 425—242 R 8 Claims



1. A feedhead device for feeding and mixing a plurality of liquid constituents to a mould cavity, which comprises: a mixing chamber means for charging the mixing chamber with said constituents under pressure; a sprue runner which adjoins the mixing chamber and flares toward said mould cavity; and flow restrictor means formed in said sprue runner, said flow restrictor means being formed by at least one shoulder of a runner wall projecting into said sprue runner.

3,995,982

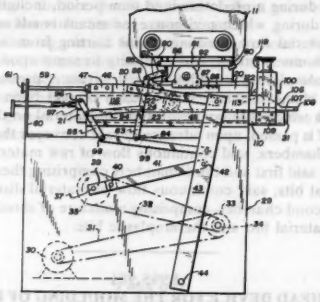
MOLDING APPARATUS

Harry H. Holly, Boca Raton, Fla., assignor to Hollymatic Corporation, Park Forest, Ill.

Division of Ser. No. 301,625, Oct. 27, 1972, Pat. No. 3,909,880, which is a continuation-in-part of Ser. No. 244,027, April 14, 1972, Pat. No. 3,928,891. This application Sept. 16, 1974, Ser. No. 506,270
Int. Cl.² A22C 7/00
U.S. Cl. 425—244 3 Claims

1. Molding apparatus for forming shaped articles from a

pressurized moldable material, comprising: mold means including a shaping cavity; a pressure chamber communicating with said cavity; a pressue ram movable in said chamber toward said cavity for pressurizing said material; supply means operatively communicating with said pressure chamber for supplying moldable material to said pressure chamber, said pressure chamber extending between and interconnecting said cavity and said pressure ram whereby said ram supplies pressure to said material in said chamber and in said cavity, said ram and compression chamber having adjacent surfaces defining a space therebetween through which pressurized material tends to leak; a movable seal member on said ram bodily pressure movable to close said space and restrict substantial leakage of said moldable material during said pressurizing of said material; and a material passage operatively interconnecting said pressure chamber and said seal member.

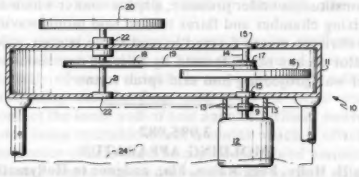


3,995,983

WHEEL FOR WORKING ON CERAMICS, PLASTICS OR STONE

Martin S. Shenker, 7700 Cindy Lane, West Bethesda, Md. 20034

Filed July 15, 1975, Ser. No. 596,179
Int. Cl.² B28B 1/02, 1/28
U.S. Cl. 425—459 3 Claims



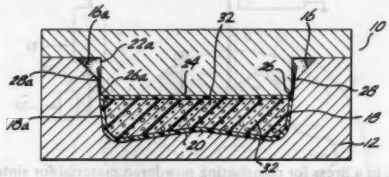
1. A potter's wheel comprising a large pulley attached on the shaft of the turntable connected by a speed reduction means which includes a belt surrounding a smaller pulley which is located on the shaft of a subtended electric motor and a flywheel located on said same shaft and including an electronic or electrical braking means selectively controllable to said motor.

3,995,984

MATCHING DIES FOR COMPOSITE CORED STRUCTURES

William H. Fetherston, Bellevue, and Roger C. Teeter, Redmond, both of Wash., assignors to Composite Structures Corporation, Kent, Wash.

Division of Ser. No. 266,645, June 27, 1972, Pat. No. 3,879,245. This application Feb. 10, 1975, Ser. No. 548,688
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² B29C 3/00, 17/00
U.S. Cl. 425—521 3 Claims



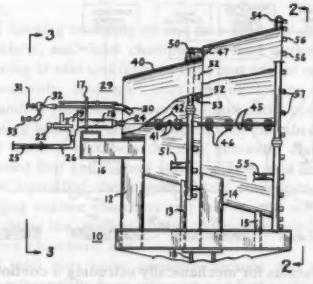
1. A pair of movable matched metal dies, for one step molding of a structural part having a core and a reinforcing cover, for use in a compression molding press the matched metal dies comprising: a lower die having a recess shaped to define the bottom and sides of a structural part; a cant extending upwardly and outwardly on all sides of the recess; an upper die extending downwardly into the recess of the lower die to contact the canted sides of the recess and to define the upper surface of a structural part, said downwardly extending upper die having sides extending at an angle of between two and ten degrees to the canted sides of the recess; and the lower die having a sharply increased outwardly extending angle to the canted sides of the recess starting on a line at least one quarter inch above the line of contact between the upper and lower dies.

3,995,985

CRUDE OIL BURNER

John F. Straitz, III, Jenkintown, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Jan. 20, 1975, Ser. No. 542,594
Int. Cl.² F23D 11/02
U.S. Cl. 431—284 7 Claims



1. Apparatus for burning crude oil comprising
a support,
a crude oil burner carried by said support and delivering crude oil in spray form for combustion,
a hollow conical flame directing member open at its front and rear ends,
said burner being disposed at said rear end for combustion of said crude oil in said directing member.

a gas assist ring manifold contiguous to the front end of said directing member and having delivery members thereon for directing a high pressure non-aqueous combustion assist gaseous medium forwardly and inwardly and inducing air into the flame advancing from said flame directing member,

an additional hollow conical flame directing member forwardly of said first mentioned directing member and axially aligned therewith and receiving the flame from said first mentioned directing member, and

an additional gas assist ring manifold contiguous to the front end of said second hollow tubular member and having delivery members thereon for directing a high pressure non-aqueous combustion assist gaseous medium forwardly and inwardly into the flame from said additional directing member and inducing air into the flame advancing from said additional flame directing member,

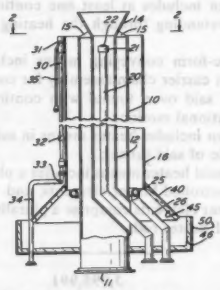
the delivery members on at least one of said ring manifolds being disposed to direct the medium in a swirling path.

3,995,986

FLARE GAS BURNER

John F. Straitz, III, c/o Combustion Unlimited Inc., P.O. Box 8856, Elkins Park, Pa. 19117

Filed Mar. 14, 1975, Ser. No. 558,283
Int. Cl.² F23D *13/20*
U.S. Cl. 431—114 **9 Claims**



1. A flare gas burner for combustible waste gas comprising

a vertical stack having a plurality of concentric pipes,

one of said pipes being an outer pipe, one of said pipes being an intermediate pipe and another of said pipes being an inner pipe.

said inner pipe having a steam discharge member therein for inducing combustion supporting air in said inner pipe,

the space between said inner pipe and said intermediate pipe providing for the delivery of said combustible waste gas for combustion,

members for imparting a rotary and diverging motion to said combustible gas upon discharge from said space between said inner and intermediate pipes, and

the space between said outer pipe and said intermediate pipe having a steam discharge member therein for inducing combustion supporting air therein for delivery into contact with said discharging combustible gas.

3,995,987

HEAT TREATMENT OF PARTICULATE MATERIALS

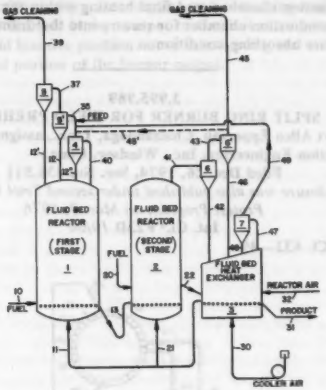
Donald MacAskill, 102 Overhill Road, Orinda, Calif. 94563

Filed Mar. 31, 1975, Ser. No. 563,863
Int. Cl.² F27B *15/00*
U.S. Cl. 432—15 **7 Claims**

1. A method for heat treating a material selected from ores, precipitates, concentrates and residues so that hydrates, carbonates and the like are decomposed while volatiles are expelled, comprising:

introducing said material into a first high capacity fluidized stage;

controlling the introduction of oxygen-containing gases to said first stage to create an environment wherein incomplete oxidation will occur while said fluidized material is being heated to about 1100° F;



transferring said partially oxidized material from said first stage to a second fluidized stage;

adding sufficient oxygen to substantially complete combustion of said partially oxidized material by heating to a temperature in excess of 1100° F; and

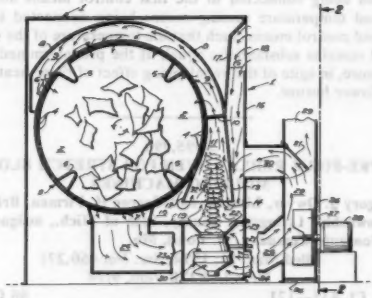
recovering said material from said second stage.

3,995,988

FUEL SAVING APPARATUS AND METHOD FOR TEXTILE DRYING AND FINISHING

Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed May 23, 1975, Ser. No. 580,487
Int. Cl.² F26B *9/00, 11/02;* **F27B** *7/00*
U.S. Cl. 432—21 **12 Claims**



1. Apparatus for drying and finishing textiles, comprising:

a. a dryer housing;

b. a perforated dryer drum rotatable in the housing;

c. a drum entrance chamber communicating with the interior of the drum for supplying heated air into the drum;

d. a secondary combustion chamber having an exit end connected to the drum entrance chamber and a downwardly directed entrance end, and a heat transfer wall;

e. a heater having an upwardly directed primary combustion chamber communicating with but spaced from the entrance end of the secondary combustion chamber;

f. a laterally air inlet and preheating chamber interposed between the primary and secondary combustion chambers and defined in part by the heat transfer wall of the secondary combustion chamber; and

g. a recirculating duct means for moistened air leading from the drum to the air inlet and preheating chamber for preheating contact with the walls of the secondary combustion chamber, and final heating within the secondary combustion chamber for reentry into the drum in a moisture absorbing condition.

3,995,989

SPLIT RING BURNER FOR WELD PREHEAT

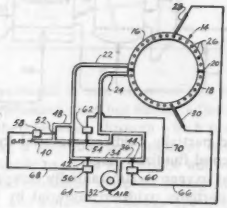
Robert Allen Epperson, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 26, 1974, Ser. No. 536,511

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² F23D *19/00*

U.S. Cl. 432—49 **2 Claims**



1. In combination, burner means for maintaining a large, vertically positioned weld in a large metal member at a predetermined temperature for extended periods of time, including first and second burners, the first being positioned below the second, first temperature sensing means positioned adjacent a lower portion of the weld, second temperature sensing means positioned adjacent an upper portion of the weld, first control means for controlling the flow of fuel and air to the first burner, second control means for controlling the flow of fuel and air to the second burner, the first temperature sensing means being connected to the first control means and the second temperature sensing means being connected to the second control means, such that the temperature of the entire weld remains substantially equal, at the predetermined temperature, in spite of the unbalancing effect of rising heat from the lower burner.

3,995,990

PRE-FORM REHEAT OVEN FOR STRETCH BLOW MOLDING MACHINES

Gregory J. Dwyer, Livonia, and George H. Pirman, Brighton Township, Livingston County, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 11, 1974, Ser. No. 450,271

Int. Cl.² F27B *9/00, 9/14*

U.S. Cl. 432—121 **46 Claims**

1. In a continuous motion pre-form reheat oven for reheating pre-forms and discharging the pre-forms onto a stretch pin means on a continuous motion stretch blow molding apparatus, the combination comprising:

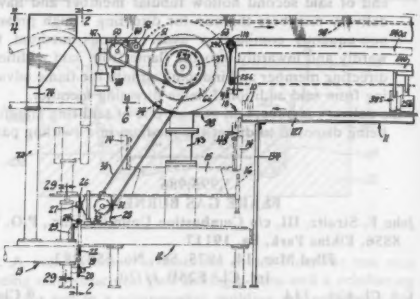
a. an oven for operative mounting adjacent a continuous motion stretch blow molding apparatus;

b. a continuous motion pre-form conveying means having a pre-form loading station and a pre-form discharge station for conveying pre-forms received at said load station longitudinally and rotationally through said oven for reheating the pre-forms, and thence conveying the pre-forms to said discharge station for discharging the pre-forms onto the stretch pin means of a stretch blow molding apparatus;

c. a pre-form loading means for loading pre-forms onto said pre-form conveying means;

d. said pre-form conveying means includes means for rotating the pre-forms as they are conveyed through the oven;

e. said oven includes a pre-form heating zone through which the pre-forms are initially conveyed, and a pre-form conditioning zone for receiving the pre-forms from the heating zone and cooling the pre-forms to a condition for blowing into a final product;



f. said oven includes at least one continuous longitudinal tunnel extending through the heating and conditioning zones;

g. said pre-form conveying means includes at least one pre-form carrier chain assembly for conveying pre-forms through said oven tunnel with continuous longitudinal and rotational motion;

h. said oven includes heater means in said heating zone on each side of said tunnel;

i. each of said heater means includes a pluarality of individually controlled heater elements; and

j. said heater elements comprise a plurality of longitudinally disposed heater rods.

3,995,991

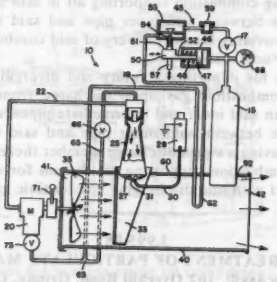
FORCED AIR HEATER

David Bruce Wilkinson, 1489 Lemcke Road, Xenia, Ohio 45385

Filed Dec. 15, 1975, Ser. No. 640,744

Int. Cl.² F24H *3/04*

U.S. Cl. 432—222 **9 Claims**



1. A forced air heater including means for storing fuel under pressure, a plenum chamber having an outlet, a fuel burner for burning the fuel and exhausting the burning fuel and hot combustion products thereof into the plenum chamber to supply heat to the plenum chamber, a fan adapted to force air through the plenum chamber, a pneumatic motor having an

inlet and an exhaust and being connected for driving the fan, and fuel conduit means connecting the fuel storing means to the motor inlet and the motor exhaust to the fuel burner, the improvement comprising:

a. an overheat dump port in the plenum chamber providing an auxiliary exit for the air forced into the plenum by the fan and for the combustion products of the burning fuel to maintain substantially uninterrupted movement and exhaust thereof in the event that the plenum outlet becomes obstructed,

b. means for exposing the fuel storing means to the heat produced by the fuel burner to help counteract the tendency of the fuel storing means to cool as fuel is withdrawn therefrom,

c. a heat duct mounted to intercept and convey a portion of the hot output from the fuel burner directly to the fuel storing means,

d. means mounting the fuel storing means near said overheat dump port, and

e. means mounting said heat duct in said overheat dump port for movement between active and inactive positions, said active position intercepting and conveying said portion of the fuel burner output to the fuel storing means, and said inactive position not so intercepting and conveying said portion of the burner output.

3,995,992

TRANSFER PRINTING PROCESS FOR DYEING AND PRINTING ORGANIC MATERIAL WHICH CAN BE DYED WITH CATIONIC DYES

Raymond Defago, Riehen; Paul Schaffluetzel, and Jaroslav Haase, both of Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 30, 1974, Ser. No. 510,944

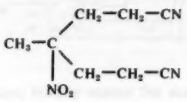
Claims priority, application Switzerland, Oct. 18, 1973, 14755/73

Int. Cl.² D06P 5/00

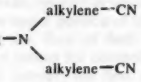
U.S. Cl. 8—2.5 R 10 Claims

1. In a process for the dyeing or printing of organic material by the transfer printing process which comprises bringing the surface of an inert carrier sheet treated with a printing ink into contact with the surface of an organic material which can be dyed or printed with cationic dyes, subjecting the carrier and organic material to heat treatment for a time and at a temperature sufficient to achieve dyeing or printing of the organic material and separating the organic material from the said inert carrier, the improvement according to which the printing ink for treating the inert carrier comprises a dispersion or solution of at least one member of the group of disperse dyestuffs, cationic dyestuffs, and mixtures thereof said dyestuffs being from among those which are converted to the vapour state at atmospheric pressure and at a temperature of between 150° C and 220° C and at least one organic compound as transfer promotor having a vapour pressure higher than 10^{-5} Torr at 200° C and being selected from the group of

a. A compound of the formula

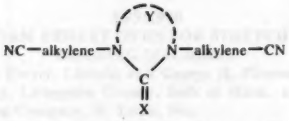


b. A compound of the formula



wherein "alkylene" is of 1 to 4 carbon atoms, R represents alkyl of 1 to 4 carbon atoms, α-hydroxyethyl, α-acetoxyethyl, cyclohexyl, phenyl, methylphenyl, dimethylphenyl, chlorophenyl, or formyl, and

c. A compound of the formula



wherein X represents oxygen or sulfur,

Y represents alkylene which bonds the group

to a ring with 5 to 7 members, and "alkylene" is of 1 to 4 carbon atoms.

3,995,993

PROCESS FOR THE DIFFERENTIAL DYEING OF POLYAMIDE FIBERS AND OF MATERIALS CONTAINING THEM

Ludwig Schläfer, Fischbach, Taunus; Maria Kallay, Mammolshain, and Johannes Jeths, Weiskirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

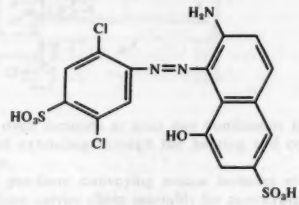
Filed Aug. 20, 1975, Ser. No. 606,105

Claims priority, application Germany, Aug. 22, 1974, 2440207

Int. Cl.² D06P 3/82; C09B 29/30

U.S. Cl. 8—21 B 3 Claims

1. A process for the differential dyeing of mixtures of natural or of synthetic or of natural and synthetic fiber materials of polyamides having components which can be dyed in different depths of shade, or of mixtures of the said polyamide fibers which can be dyed in different depths of shade, with other natural of synthetic fibers, which comprises dyeing the said fiber material at a temperature of from 60° to 150° C with an aqueous solution or paste containing the monoazo dyestuff of the formula



or padding the said fiber material at a temperature in the range of from 10° to 60° C and subsequently steaming at a temperature of from 100° to 150° C, each at a pH-value of 2 to 9.

3,995,994

DISPERSE DYESTUFF MIXTURES

Colin William Greenhalgh; Ronald Wynford Kenyon, and Andrew John Logan, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 28, 1975, Ser. No. 599,346

Claims priority, application United Kingdom, July 31, 1976, 33700/76

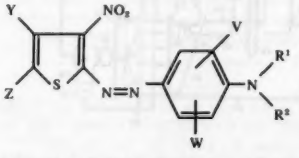
Int. Cl.² C09B 27/00, 45/48

U.S. Cl. 8—26 3 Claims

1. Process for the colouration of aromatic polyester textile materials which comprises applying to the said textile material by a dyeing, padding or printing process an aqueous dispersion of a dyestuff mixture consisting of:

a. from 2% to 60% by weight (based on the total weight of dyestuffs in the mixture) of a water-insoluble monoazo dyestuff, free from sulphonic acid and carboxylic acid groups, which is of the formula:

Formula I



wherein Y represents hydrogen, nitro, lower alkyl or optionally substituted phenyl;

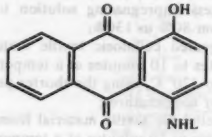
Z is lower alkyl optionally substituted phenyl, nitro, cyano, optionally substituted lower alkoxycarbonyl or

carbonamido; V is hydrogen, chlorine, optionally substituted alkyl or optionally substituted alkoxy;

W is hydrogen, chlorine, bromine, optionally substituted alkyl, optionally sub-stituted alkoxy, optionally substituted alkylthio, lower alkoxycarbonyl, carbonamido, sulphonamido, lower alkylcarbonyl, lower alkylsulphonyl, lower alkylsulphonyloxy, cyano, trifluoromethyl, lower alkylcarbonyloxy, benzoyloxy, lower alkylsulphonylamino, or sulphamato;

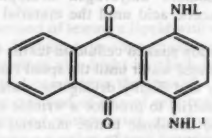
R^1 and R^2 each independently represent a hydrogen atom or an optionally substituted alkyl, cycloalkyl, phenyl or heterocyclic radical or R^1 and R^2 together form with the nitrogen atom N a 5- or 6-membered nitrogen-containing heterocyclic ring, or R^1 may be joined together with V when it is in ortho position to the amino group to form a 6-membered nitrogen-containing heterocyclic ring, or V and W when they are in ortho position to each other may be joined together to form a group of 4 carbon atoms so as to form a naphthalene ring;

b. from 40% to 95% by weight (based on the total weight of dyestuffs in the mixture) of (i) at least one disperse anthraquinone dyestuff of the formula:



Formula II

which can contain up to 30% of its own weight of a disperse anthraquinone dyestuff of the formula:



Formula III

wherein L and L^1 each independently represent a phenyl radical which can be substituted by one or more chlorine or bromine atoms or by hydroxy, amino, lower alkyl, lower alkoxy, hydroxyloweralkoxy, N-lower alkylamino, acylamino, N:N-di(lower alkyl)amino, carbo lower alkoxy, lower alkoxycarbonyloxy or lower alkylcarbonyloxy groups; and from 0 to 50% by weight (based on the total weight of dyestuffs present in the mixture) of at least one yellow to red disperse dyestuff as hereinbefore defined.

3,995,995
PROCESS FOR DYEING FIBRES CONTAINING AMIDE GROUPS

Horst Nickel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

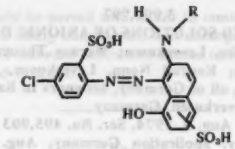
Filed July 23, 1975, Ser. No. 598,267

Claims priority, application Germany, July 31, 1974, 2436899

Int. Cl.² D06P 1/02; C07C 107/08

U.S. Cl. 8—41 B **2 Claims**

1. Process for dyeing fibres containing amide groups, characterised in that a monoazo dyestuff which in the form of the free acid corresponds to the formula



wherein

R represents hydrogen or C_1-C_4-alkyl

is used.

3,995,996
AGENTS FOR IMPROVING WET FASTNESS PROPERTIES

Hellmuth Pantke, Leichlingen, and Karl Vogel, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 27, 1973, Ser. No. 354,959

Claims priority, application Germany, Apr. 27, 1972, 2220710

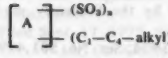
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² D06P 5/02

U.S. Cl. 8—74 **16 Claims**

1. Agents for improving the wet fastness properties of dyeings of cellulose materials with direct dyes and of dyeings produced on synthetic polyamides with acid dyes, cationic dyes or disperse dyes from organic water immiscible solvents comprising the organic water immiscible solvent soluble adduct of *a*, *b* and *c* wherein

a is a customary wet fastness improving agent selected from the group consisting of condensation products of formaldehyde with dicyandiamide, quanidine or dicyandiamide and guanidine; polyethylene polyamines; alkylated polyethylene polyamines; condensation products of formaldehyde and hydroxydiarylsulfones; co-condensation products of dihydroxydiarylsulfones, aromatic sulfonic acids and formaldehyde; and the alkali metal or ammonium salt of the condensation product of the condensation product of aromatic sulfonic acids and formaldehyde having the formula



wherein

A is diphenyl ether radical;

m is a whole number from 0 to 2; and

n is a number from 0.5 to 2;

b a surface-active amine or amine oxide which contains at least one C_{12}-C_{22}-alkyl or alkenyl radical which is directly attached or is attached via a phenyl, benzyl or —CO–NH-alkylene- bridging member to the amino or amine oxide nitrogen atom; and *c* an anionic surface-active agent.

3,995,997

CONCENTRATED SOLUTIONS OF ANIONIC DYESTUFFS

Guenther Boehmke, Leverkusen; Werner Theuer, Opladen-Luetzenkirchen; Konrad Nonn, Leverkusen, and Georg Pape, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1974, Ser. No. 495,903

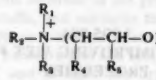
Claims priority, application Germany, Aug. 16, 1973, 2341293

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] D06P *3/14*

U.S. Cl. 8—84 2 Claims

1. Anionic dyestuffs which contain a carboxyl or sulfonic acid substituent and from 1 mole per dyestuff molecule to 1 mole equivalent per mole of the acid group in the dyestuff molecule of at least one cation of the formula



wherein

R_1, R_2, and R_3 denote alkyl with 1–6 carbon atoms, cycloalkyl with 5–7 carbon atoms, aralkyl with 7–12 carbon atoms, or the group:

wherein

R_4 and R_5 denote hydrogen, methyl or ethyl and n is a number from 1 to 20.

3,995,998

METHOD OF POLYMERIZING AND FIXING CARBOXYL-CONTAINING VINYL MONOMERS IN HIGH CONVERSION ON FIBROUS SUBSTRATES

Stanley P. Rowland; Vidabelle O. Cirino, and Earl J. Roberts, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,419

Int. Cl.[2] D06M *13/20*, *15/14*

U.S. Cl. 8—115.6 4 Claims

1. A process for preparing cellulosic or synthetic fibers having hydrophilic, soil-release and anti-static properties comprising:

a. wetting a cellulosic or synthetic fiber in an aqueous solution consisting essentially of a water-soluble carboxyl containing acrylic or vinyl monomer, a water-soluble non-acidic acrylic or vinyl monomer a water-soluble free radical initiator, said aqueous solution having a pH greater than 3.6 and a water content of about 85 weight percent; and

b. curing the wetted fiber from (a).

3,995,999

PROCESS OF IMPARTING CREASABILITY OF CELLULOSIC AND OTHER HYDROXY-CONTAINING POLYMERIC FIBERS AND FABRICS BY REACTION OF N-METHYLOL DERIVATIVES IN THE PRESENCE OF PHOSPHORYLATING AGENTS AND PRODUCTS

Stanley R. Hobart, New Orleans; Charls H. Mack, Covington, and Stanley P. Rowland, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 399,013, Sept. 20, 1973, abandoned. This application July 10, 1975, Ser. No. 594,898

Int. Cl.[2] D08M *13/34*

U.S. Cl. 8—116 P 16 Claims

1. A process for preparing a wrinkle resistant cellulosic textile material with inherent, optional, post-treatment creasing capability which process consists of the following stepwise operations:

a. impregnating a cellulosic textile material with an aqueous solution of pH 1.0 to 6.4 containing about from 5% to 15% of dimethyloldihydroxyethylene urea and about from 1% to 10% of a phosphorylating agent selected from the group consisting of sodium dihydrogen orthophosphate, ammonium dihydrogen orthophosphate, sodium hexametaphosphate, and orthophosphoric acid;

b. removing the excess impregnating solution to a wet pickup of about from 80% to 130%;

c. drying the impregnated cellulosic textile material for about from 2 minutes to 10 minutes at a temperature of about from 90° C to 120° C, using the shorter periods of time with the higher temperatures;

d. curing the dried cellulosic textile material from (c) for about from 2 minutes to 10 minutes at a temperature of about from 140° C to 170° C, using the shorter periods of time with the higher temperatures;

e. soaking the dried cellulosic material from (d) in an aqueous solution containing about from 1% to 5% of an acidifying reagent selected from the group consisting of orthophosphoric acid, sodium dihydrogen orthophosphate monohydrate and acetic acid until the material is completely wetted;

f. rinsing the acid solution soaked cellulosic textile material from (e) with de-ionized water until the spent rinse water tests free of acidity and finally drying the water rinsed cellulosic textile material to produce a wrinkle resistant, chemically modified cellulosic textile material with optional creasing capability.

3,996,000

PROCESS FOR DYEING SYNTHETIC FIBERS

Hermann Beecken, Schildgen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 25, 1975, Ser. No. 552,806

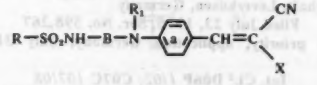
Claims priority, application Germany, Feb. 27, 1974, 2409464

Int. Cl.[2] D06P *3/52*; C07C *121/50*

U.S. Cl. 8—179 4 Claims

1. In an exhaustion process for dyeing synthetic fiber materials from organic, water-immiscible solvents, the improvement which comprises employing a dyeing liquor which consists essentially of:

1. a styryl dyestuff which is substantially insoluble in tetrachloroethylene at room temperature and has the formula



wherein

R is alkyl, aralkyl or aryl;

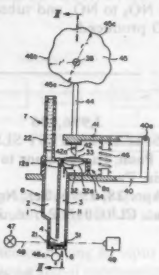
R_1 is hydrogen, alkyl, or R—SO_2NH—B—;

B is alkylene which may be interrupted by hetero-atoms;
X is cyano or CO_2R_2;
R_2 is alkyl or aralkyl; and the abovementioned alkyl, cycloalkyl, aralkyl and aryl radicals and ring *a* may be substituted by non-ionic substituents customary in dyestuff chemistry;
2. an organic water-immiscible solvent, and
3. 0–1% water based on the weight of said solvent.

3,996,001
METHOD OF AND DEVICE FOR THE ANALYSIS OF LIQUIDS

Manuel Sanz, Grand-Lancy, and Georges Revillet, Onex, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed May 12, 1975, Ser. No. 576,306
Claims priority, application Switzerland, May 10, 1974, 6391/74
Int. Cl.² G01N *31/00, 31/22, 33/16;* B65B *3/04*
U.S. Cl. 23—230 R **13 Claims**



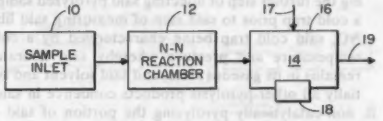
1. A method of testing a liquid with a reagent in a receptacle having a U-shaped passage comprising a pair of branches joined together at a bight in which is provided said reagent, said method comprising the step of:
dipping one end of one of said branches in a body of said liquid and withdrawing gas from the other branch to aspirate a portion of said liquid into said one branch;
thereafter preventing gas escape from the other of said branches and positioning said receptacle with said portion of liquid above said bight;
thereafter permitting gas to escape from said other branch and flowing said liquid gravitationally down said other branch into said bight and there reacting said liquid with said reagent; and
thereafter passing light through said receptacle and said liquid and reagent at said bight to analyze the reaction between said reagent and said liquid.

6. An apparatus for reacting a liquid with at least one reagent, said apparatus comprising:
a receptacle having a U-shaped passage, said passage comprising a bight and a pair of side-by-side branches codirectionally extending from said bight, said reagent being disposed in said bight, an end of one of said branches being open permanently to the atmosphere and forming a liquid storage compartment in which the liquid is held in place out of contact with said reagent by gas filling the remainder of said receptacle and prevented from escape therefrom when said compartment contains said liquid;
a pair of light-permeable windows in said receptacle across from each other at said bight, whereby light can pass through said receptacle at said bight for analysis of the reaction of said liquid with said reagent; and
a resilient elastic wall closing off the end of the other branch and formed at least partially of self-sealing elastic material, said wall being piercable to vent said gas from said receptacle to permit said liquid to contact said reagent, said wall being constructed and arranged so that its inward and outward deflection causes mixing of said liquid with said reagent.

3,996,002
METHOD AND APPARATUS FOR MEASURING THE N-NITROSO COMPOUND CONTENT OF A SAMPLE

David H. Fine, Framingham, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 329,949, Feb. 5, 1973, Pat. No. 3,973,910. This application Sept. 17, 1975, Ser. No. 614,101
Int. Cl.² G01N *21/52, 23/54, 31/10*
U.S. Cl. 23—230 PC **12 Claims**



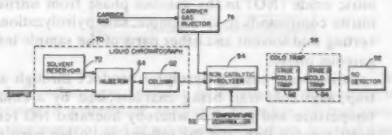
7. Method for measuring in a sample the amount of N-nitroso compounds having the general formula:

wherein R_1 and R_2 are the same or different organic radicals, including those radicals which together with the non-nitroso N of the depicted N-NO bond constitute a nitrogen heterocylic radical, and wherein the N-NO bond is the weakest bond in the molecule, and wherein said sample is free of nitrate and nitrite compounds, comprising the steps of:
A. non-catalytically pyrolzing said sample at a temperature in the range 300° C to 500° C to selectively liberate nitric oxide (NO) in the gaseous phase whereby said pyrolyzing step provides an amount of thermal energy sufficient to break the N-NO bond and insufficient to break other molecular bonds in any substantial numbers; and
B. measuring in the gaseous phase the amount of nitric oxide (NO) liberated by said pyrolyzing means.

3,996,003
SPECIFIC COMPOUND DETECTION SYSTEM WITH LIQUID CHROMATOGRAPH

David H. Fine, Framingham, and David P. Rounbehler, Bedford, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Sept. 17, 1975, Ser. No. 614,286
Int. Cl.² G01N *31/08*
U.S. Cl. 23—230 PC **8 Claims**



6. Method for measuring in a sample the amount of N-nitroso compounds having the general formula:

wherein R_1 and R_2 are the same or different organic radicals, including those radicals which together with the non-nitroso N of the depicted N—NO bond constitute a nitrogen heterocyclic radical, and wherein the N—NO bond is the weakest bond in the molecule, comprising the steps of:

A. chromatographically separating N-nitroso compounds from nitrate and nitrite compounds in said sample by passing said sample through a liquid chromatograph column, wherein said sample is dissolved in a solvent, including the further step of injecting said pyrolyzed sample into a cold trap prior to said step of measuring said liberated NO, said cold trap being characterized by a cold trap temperature and pressure whereby said liberated NO remains in its gaseous state, and said solvent and substantially all other pyrolysis products condence in said trap;

B. non-catalytically pyrolyzing the portion of said sample having said N-nitroso compounds at a temperature in the range 300° C to 500° C to selectively liberate nitric oxide (NO) in the gaseous phase whereby said pyrolyzing step provides an amount of thermal energy sufficient to break the N—NO bond and insufficient to break other molecular bonds in any substantial numbers; and

C. measuring in the gaseous phase the amount of nitric oxide (NO) liberated by said pyrolyzing means.

3,996,004

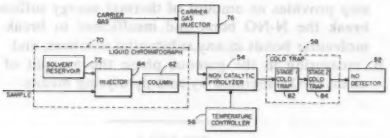
DETECTION SYSTEM WITH LIQUID CHROMATOGRAPH

David H. Fine, Framingham, and David P. Rounbehler, Bedford, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Sept. 17, 1975, Ser. No. 614,287

Int. Cl.² G01N *31/08*

U.S. Cl. 23—230 PC **2 Claims**



1. Method for measuring in a sample the amount of nitrate and nitrite compounds comprising the steps of:

A. chromatographically separating nitrite and nitrite compounds in said sample from each other and from other compounds in said sample by passing said sample through a liquid chromatograph column, wherein said sample is dissolved in a solvent;

B. continuously pyrolyzing said dissolved sample from said liquid chromatograph column for selectively liberating nitric oxide (NO) in the gaseous phase from nitrite and nitrite compounds in said sample, said pylrolyzation converting said solvent and other parts of the sample into the gaseous phase;

C. continuously passing pyrolyzer product through a cold trap, said cold trap being characterized by a cold trap temperture and pressure whereby liberated NO remains in its gaseous state and the solvent and other parts of the sample condense in said trap; and

D. continuously measuring in the gaseous phase the amount of nitric oxide (NO) contained in effluent from said cold trap.

3,996,005

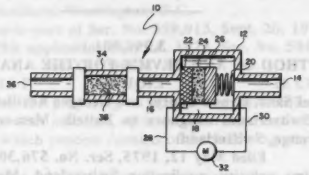
DETECTION AND MEASUREMENT OF NO_2 AND O_3

Leo E. Topol, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1975, Ser. No. 622,300

Int. Cl.² C01B *7/00*; G01N *21/26, 27/26, 33/00*

U.S. Cl. 23—232 R **3 Claims**



1. A method for the determination of NO_2 in air which comprises reacting air containing NO_2 with solid PbI_2, CuI, BiI_3, AuI, PdI_2, TlI or ZnI_2 to effect an essentially quantitative conversion of said NO_2 to NO, and subsequently determining the quantity of NO produced.

3,996,006

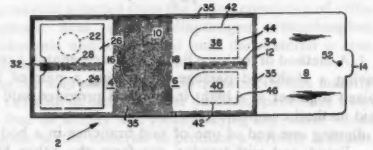
SPECIMEN TEST SLIDE

Joseph F. Pagano, Paoli, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Apr. 28, 1976, Ser. No. 681,080

Int. Cl.² G01N *21/06, 31/22*

U.S. Cl. 23—253 **10 Claims**



1. A specimen test slide comprising:

a front panel,

a rear panel,

said front panel having a plurality of openings,

sheet means between the front and rear panels underlying each of said openings for the reception of a specimen and with the portion of the sheet under each opening carrying a test reagent,

a hinged cover adapted to overlie a portion of the front panel and said openings, and

tab means in the rear panel opposite said openings and pivotable to expose the underside of the sheet.

3,996,007

TIME-TEMPERATURE INTEGRATING INDICATOR

Shou-Mean Fang, Lake Hiawatha, and Craig R. Hof, Hopatcong, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

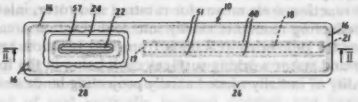
Continuation-in-part of Ser. No. 515,165, Oct. 16, 1974, Pat. No. 3,932,134. This application Oct. 29, 1975, Ser. No. 626,981

Int. Cl.² G01N *21/06, 21/20, 31/22*

U.S. Cl. 23—253 TP **7 Claims**

1. In a Time-Temperature Indicator comprising a gas generating means, a rate controlling film and a wicking means having incorporated therein an indicator composition the

improvement which comprises the gas generating means being contained in an ampule surrounded by a protective layer and



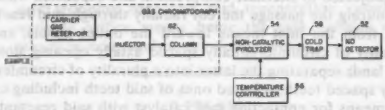
enclosed in a sealed pouch at least a part of which pouch is made of rate controlling film material.

3,996,008

SPECIFIC COMPOUND DETECTION SYSTEM WITH GAS CHROMATOGRAPH

David H. Fine, Framingham; David P. Lieb, Lexington, and David P. Rounbehler, Bedford, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Sept. 17, 1975, Ser. No. 614,099
Int. Cl.² G01N *31/08*
U.S. Cl. 23—254 R **2 Claims**



1. A gas chromatograph detection system for detecting the amount of predetermined compounds in a sample comprising, in combination:

A. a specific gas detector having an input port and including means for providing a signal representative of the amount of said specific gas injected into said input port,

B. a gas chromatograph having a carrier gas reservoir, a column with an input end and an output end, a means for dissolving said sample in said carrier gas and means for injecting the resulting gas solution into said column at said input end,

C. a cold trap having an input port for receiving a cold trap input gas, and an output port including means for injecting gaseous cold trap effluent into said detector input port, said cold trap input gas consisting of said carrier gas, said specific gas and other compounds in the gaseous state, and said cold trap including means for cooling said cold trap input gas to a relatively low trap temperature at a predetermined trap pressure whereby said gaseous cold trap effluent substantially consists of said specific gas,

D. chromatograph-cold trap joinder means for receiving gaseous effluent from said output end of said column, for transforming said effluent to said cold trap input gas, and for injecting said cold trap input gas into said cold trap input port, wherein said specific gas is characterized by a vapor pressure whereby said specific gas exists only in the gaseous state at said trap temperature and trap pressure, and said carrier gas and said other compounds are characterized by a vapor pressure whereby said carrier gas and said other compounds exist only in the liquid or solid state at said trap temperature and trap pressure.

3,996,009

SPECIFIC COMPOUND DETECTION SYSTEM

David H. Fine, Framingham, and David P. Lieb, Lexington, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

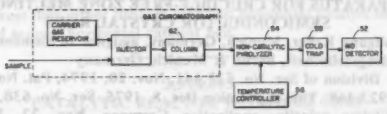
Filed Sept. 17, 1975, Ser. No. 614,100
Int. Cl.² G01N *31/08*
U.S. Cl. 23—254 R **2 Claims**

1. A gas chromatograph detection system for detecting the amount of predetermined compounds in a sample comprising, in combination:

A. a specific gas detector having an input port and including means for providing a signal representative of the amount of said specific gas injected into said input port,

B. a gas chromatograph having a carrier gas reservoir, a column with an input end and an output end, a means for dissolving said sample in said carrier gas and means for injecting the resulting gas solution into said column at said input end,

C. a cold trap having an input port for receiving a cold trap input gas, and an output port including means for injecting gaseous cold trap effluent into said detector input port, said cold trap input gas consisting of said carrier gas, said specific gas and other compounds in the gaseous state, and said cold trap including means for cooling said



cold trap input gas to a relatively low trap temperature at a predetermined trap pressure whereby said gaseous cold trap effluent substantially consists of said specific gas and said carrier gas,

D. chromatograph-cold trap joinder means for receiving gaseous effluent from said output end of said column, for transforming said effluent to said cold trap input gas, and for injecting said cold trap input gas into said cold trap input port,

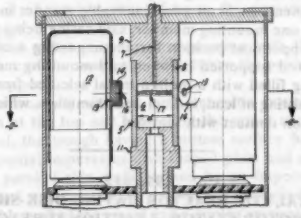
wherein said carrier gas and said specific gas are characterized by a vapor pressure whereby said carrier gas and said specific gas exist only in the gaseous state at said trap temperature and trap pressure, and said other compounds are characterized by a vapor pressure whereby said other compounds exist only in the liquid or solid state at said trap temperature and trap pressure, and wherein further said specific gas detector is relatively insensitive to said carrier gas.

3,996,010

BREATHING GAS ANALYZER

Robert B. Fraser, El Cerrito, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.

Continuation-in-part of Ser. No. 528,089, Nov. 29, 1974, Pat. No. 3,951,607. This application Mar. 25, 1976, Ser. No. 670,127
Int. Cl.² G01J *3/50*; G01N *21/26*, *33/16*; H01I *5/16*
U.S. Cl. 23—254 E **7 Claims**



1. A breathing gas analyzer especially for pulmonary use comprising a cylindrical analyzing chamber of transparent insulating material and of substantially uniform internal diameter of from about 0.06 to 1.0 inches between said ends, a cathode at one end of said chamber and having extending axially therethrough a conduit of a diameter of about 0.03 to 0.25 inches adapted to be connected to a source of breathing

gas, an anode at the other end of said chamber and having extending axially therethrough a duct of a diameter of about 0.03 to 0.25 inches for connecting said chamber to a subatmospheric pressure and thereby draw gases from said conduit through said chamber and out said duct, means for applying to said cathode and said anode a voltage difference to cause radiation from gas in said chamber and establish a negative glow region in said chamber, a radiation detection device disposed alongside said chamber in a direct radiation path therefrom, means disposed in said path for limiting radiation on said device to radiation from said negative glow region, and a radiation filter in said path adapted to transmit primarily radiation from a selected gas in said negative glow region.

3,996,011

APPARATUS FOR CRUCIBLE-FREE ZONE MELTING OF SEMICONDUCTOR CRYSTAL RODS

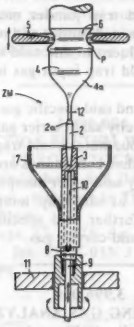
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468. This application Dec. 8, 1975, Ser. No. 638,302

Claims priority, application Germany, Nov. 22, 1973, 2358300

Int. Cl.² B01J *17/10*

U.S. Cl. 23—273 R **2 Claims**



1. A device for crucible-free zone melt processing of a semiconductor crystal rod comprising:

an operative crucible-free zone melt apparatus including two vertically opposing approximately coaxially mounted members for supporting a semiconductor rod within said apparatus; and

a funnel-shaped casing coupled to the lower of said mounting members in an axially movable manner in relation to said one mounting member, said casing being movable to an uppermost position for encompassing a cone area of the rod supported between said mounting members and being filled with a molten metal selected from the class consisting of lead, indium and aluminum, which re-solidifies on contact with said rod.

3,996,012

CATALYTIC REACTOR HAVING DISK-SHAPED, ROTOR-STATOR, REACTION SURFACES

Friedrich J. Zucker, Norf, Germany, assignor to Hans Heinrich Auer, Oberbuschweg, Germany

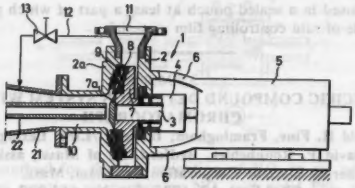
Filed Dec. 18, 1974, Ser. No. 533,887

Claims priority, application Germany, Dec. 21, 1973, 2363888

Int. Cl.² B01J *8/02, 8/08*

U.S. Cl. 23—288 E **16 Claims**

1. Apparatus for the continuous reaction of reactants in flowable form in conjunction with a catalyst for carrying out chemical reactions comprising a rotatable rotor and a stationary stator, said rotor and stator having axially opposing continuously spaced working surfaces defining therebetween an open reaction area, means for rotating said rotor, inlet means for delivering reactants axially into said reaction area, outlet means for delivering reactants from said reaction area, said rotor and stator working surfaces each being in the form of a plurality of radially spaced axially projecting lands and axially



recessed valleys, said lands and valleys being in intermeshed relationship whereby upon rotation of said rotor the reactants are subjected to alternate compression and expansion while in and during the passage thereof radially through said reaction area from the inlet means toward the outlet means, and a plurality of circumferentially spaced axially opening slots in said lands separating the latter into a plurality of circumferentially spaced teeth, selected ones of said teeth including catalyst means for contacting said catalyst with said reactants at said reaction area.

3,996,013

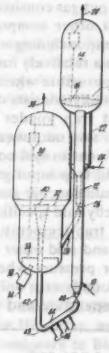
CATALYTIC HYDROCARBON CONVERSION APPARATUS

Edward C. Luckenbach, Mountainside, and Arthur C. Worley, Morristown, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 451,804, March 18, 1974, Pat. No. 3,923,642. This application Feb. 7, 1975, Ser. No. 547,771

Int. Cl.² B01J *8/26*

U.S. Cl. 23—288 B **8 Claims**



1. In an apparatus for the catalytic conversion of hydrocarbons, which comprises a catalyst regeneration vessel adapted to contain a fluidized bed of finely divided catalyst, a transferline riser wherein hydrocarbons are at least partially converted, a gas-solids disengaging vessel, and means for circulating finely divided catalyst between said vessels, the improvement which comprises:

a sole standpipe having an upper section extending through the lower portion of a regeneration vessel and terminating in an enlarged open end, said enlarged open end being an axially located overflow well, said sole standpipe being connected at its lower end to an angle bend; a vertically inclined conduit connected at its lower end to the other end of said angle bend; means for introducing a transporting gas into said vertically inclined conduit; a straight vertical conduit connected at its lower end to the upper end of said vertically inclined conduit and having its upper end opening into in a gas-solids disengaging vessel; means for introducing hydocarbons into said vertically straight conduit; said gas-solids disengaging vessel comprising means for supporting a fluidized bed of catalyst in its lower portion, gas-solids separation means in its upper portion and outlet means for vaporous effluent, a stripping zone positioned at a bottom portion of said gas-solids disengaging vessel, said stripping zone being separated and at a spaced distance from said straight vertical conduit, means for introducing a stripping gas into said stripping zone, said stripping zone being connected at its lower end to one end of a conduit for conveying stripped catalyst, said stripped catalyst conduit having an other end connected to said regeneration vessel, and a variable orifice catalyst flow control means positioned between said stripping zone and said regeneration vessel, said variable orifice means being the sole variable orifice means in said catalyst circulation means.

3,996,014

METHANATION REACTOR

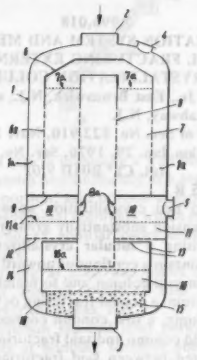
Wolf-Dieter Müller, Frankfurt am Main; Friedrich-Wilhelm Möller, Seulberg, and Karl Pirl, Bad Nauheim-Rodgen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 4, 1975, Ser. No. 583,827

Claims priority, application Germany, June 7, 1974, 2427530

Int. Cl.² B01J 8/04

U.S. Cl. 23—288 R **2 Claims**



1. A reactor for catalytically converting gases which contain carbon oxides, hydrogen and water vapor into methane at temperatures between about 250° C and 550° C and under pressures in the range of 10–80 kg/cm², comprising a substantially cylindrical outer shell provided at opposite end faces with a gas inlet and a gas outlet, an inner vessel impermeable to gas adjacent the inlet and having a substantially cylindrical shell which defines a flow passage with the inside surface of the outer shell of the reactor, said shell having openings for the radially inward passage of the gas mixture to be reacted, a central gas collecting tube containing no catalyst and positioned axially in the inner vessel, a catalyst occupying about 60–90% of the volume of the annulus of said inner vessel, said tube being perforated within said inner vessel, a bottom impermeable to gas positioned below said inner vessel and extending between said tube and said outer shell, a first horizontal catalyst bed below said bottom and supported by a grate, a clearance space between said first horizontal catalyst bed and said bottom, said tube extending through said clearance space and said first horizontal catalyst bed, said tube being perforated near said clearance space and being impermeable to gas within said first horizontal catalyst bed, a hood below said first horizontal catalyst bed extending from said tube downwardly to a second horizontal catalyst bed positioned within said hood near said gas outlet, said tube extending with its perforated end portion into said hood, at least one catalyst-free flow passage between said second horizontal catalyst bed and said inside surface of said outer shell and from the grate of said first horizontal catalyst bed to said gas outlet, whereby in order for gas from said tube to leave said reactor through said gas outlet it must flow either through said first horizontal catalyst bed or said second horizontal catalyst bed.

3,996,015

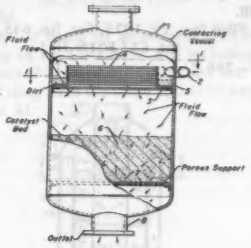
CATALYTIC REACTOR WITH DIRT TRAP

Le Roi E. Hutchings, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 533,113, Dec. 16, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,267

Int. Cl.² B01J 8/02

U.S. Cl. 23—288 R **1 Claim**



1. A hydrocarbon conversion reactor for use with a feed stream which comprises vaporized hydrocarbons and entrained particulate matter which comprises:

a. a vertically oriented vessel having an internal volume located within a cylindrical interior side wall and having upper and lower sections;

b. a porous horizontal support disposed within the lower section of the vessel;

c. a bed of catalyst situated upon the porous horizontal support;

d. a fluid outlet means communicating with the internal volume of the vessel at a point below the porous horizontal support;

e. a horizontally situated actinomorphic trough which is open at the top and located in the upper section of the vessel, the trough having a bottom surface formed by a horizontal impervious disk-shaped plate and also having two parallel side walls formed by an impervious outer vertical wall comprising a portion of the cylindrical interior side wall of the vessel and a porous vertical cylindrical conduit located in spaced relationship from the impervious outer vertical wall, the porous vertical cylindrical conduit terminating at horizontal circular upper and lower edges and surrounding a centrally located cylindrical fluid passageway which extends through the trough; and,

d. a fluid inlet means in communication with the internal volume of the vessel through an opening in the impervi-

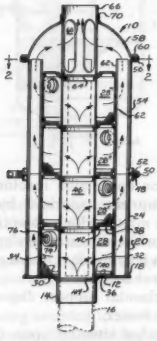
ous outer vertical wall of the trough and having an outlet which is aligned tangentially with the cylindrical interior side wall of the vessel, whereby the feed stream enters the vessel at a point within the trough and is discharged into the trough tangentially to the cylindrical interior side wall of the vessel, at least a portion of the particulate matter entrained in the feed stream is collected in the trough, any liquid in the feed stream may pass through the wall of the trough formed by the porous vertical cylindrical conduit and descend to the bed of catalyst, and the majority of vaporized hydrocarbons in the feed stream will leave the trough through the trough's open top and then descend unfiltered through the porous vertical cylindrical conduit to the bed of catalyst.

3,996,016

VARIABLE CAPACITY CATALYTIC CONVERTER

Melvin H. Wagner, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,120
Int. Cl.² F01N *3/15*
U.S. Cl. 23—288 F **11 Claims**



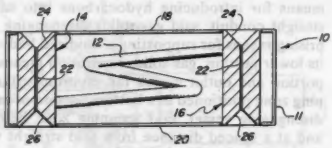
1. A catalytic converter comprising a housing inlet and outlet tubes attached to said housing, and a plurality of identical, radial flow catalyst containing modules positioned axially within said housing, each of said modules having inner and outer perforated catalyst retaining screen portions and complementary, male and female, upstream and downstream end cap portions connecting said screen portions and serving to retain a stack of said modules in axial alignment when pressure is applied by said housing to the ends of the stack; spacer means carried by said housing for supporting said stack of modules against radial movement toward the side wall portions of the housing while permitting axial movement; turbulence inducing means extending radially from at least one of said screen portions on each of said modules into an axially extending inlet gas chamber which is closed at its downstream end while being defined along the major portion of its length by a screen portion on each of said modules; and releasable fastening means for holding at least two axially adjacent portions of said housing in sealed relationship with each other.

3,996,017

CASSETTE SEPARATING COLUMN SYSTEM FOR CHROMATOGRAPHY

Rudolph E. Kaiser, Dr. Dahlem Strasse 9, Bad Durkheim 6702, Germany

Filed Nov. 23, 1973, Ser. No. 418,277
Claims priority, application Germany, Nov. 24, 1972, 2257575
Int. Cl.² B01D *15/08*; G01N *31/04, 31/06*
U.S. Cl. 23—292 **7 Claims**



1. A chromatographic column cassette comprising:
a. a housing;
b. a chromatographic separating column mounted within said housing;
c. respective coupling members each with a flow passage therein being located within said housing and being connected to the ends of said column, said flow passage being in communication with the interior of said column and the exterior of said housing, each of said coupling members further having two open ends terminating at the exterior of said housing in conical surfaces lying on a common axis and coaxially adjoining said flow passage, said column being connected to said flow passage at a locus between said two conical surfaces in a non-parallel relationship with respect to said flow passage, said conical surface being disposed adjacent said housing and being accessible from and at the exterior of said housing for receiving and making sealing engagement with a connection fitting having a complementary conical surface.

3,996,018

CRYSTALLIZATION SYSTEM AND METHOD USING CRYSTAL FRACTURING EXTERNAL TO A CRYSTALLIZATION COLUMN

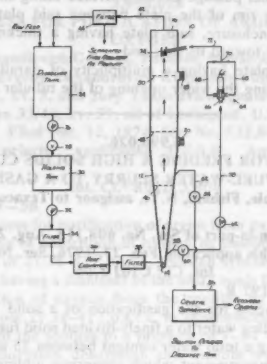
Michael Midler, Jr., East Brunswick, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 522,910, Nov. 11, 1974. This application Jan. 29, 1976, Ser. No. 653,402
Int. Cl.² B01D *9/02*
U.S. Cl. 23—295 R **10 Claims**

1. A fluidized bed crystallization apparatus for crystals having one dimension substantially greater than another dimension comprising a tubular crystallizer column, means connected to maintain a continuous upward flow of supersaturated fluid within said column and to maintain a bed of crystals fluidized therein, a crystal fracturing device located externally of said column, a first conduit connected between near the bottom of said column and said fracturing device, a further conduit connected between said fracturing device and said column above the upper level of said bed, and pumping means in one of said conduits to maintain a continuous flow from the column through said first conduit, said fracturing device, said further conduit and back into said column, a conduit connected between said column above the lower level of said bed and a crystal product separator, and an output conduit for conducting flow of solution out from the upper end of said column.

6. A method of producing crystals having one dimension substantially greater than another dimension from a supersaturated solution, said method comprising the steps of causing said supersaturated solution to flow upwardly through a column in which a fluidized bed of crystals is maintained, and

during such flow, extracting large crystals from near the bottom of said column, fracturing the extracted crystals outside



the column and flowing the resulting fractured crystal particles back into the column above said fluidized bed of crystals.

3,996,019

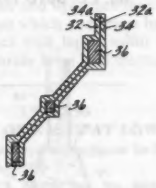
FABRICATION METHOD AND FABRICATED ARTICLE

Richard M. Cogan, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 18, 1975, Ser. No. 569,183

Int. Cl.² B23P *3/20*

U.S. Cl. 29—191.4 **3 Claims**



1. A fabricated article including a wall portion of sectional thickness which varies non-uniformly as a result of an enlargement in the wall portion, said portion comprising:

a plurality of sheet metal members which include an annular inner shell and an annular outer shell, each having a bonding surface;

an inert comprising at least one insert member retained between said annular shells at said portion of non-uniform varying thickness; and

a solid-state diffusion bonded joint between said annular shell members at bonding surfaces about said insert to retain and substantially enclose said insert between said annular shell members at said portion.

3,996,020

HELICALLY FORMED STEEL CORD

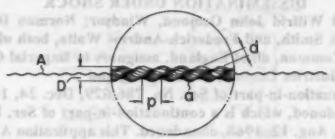
Kiyoshi Hosoya, Yokohama, Japan, assignor to Tokyo Rope Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,411

Int. Cl.² B21B *15/02*

U.S. Cl. 29—191.6 **2 Claims**

1. A reinforcement for elastomers, comprising: a cold-formed, stranded, cylindrical steel cord having a given diameter twisted into a helix, having a maximum breaking elongation of not less than 5%; the outer diameter of said helix being



1.2 to 5 times said given diameter of said cord, and the pitch of said helix being 4 to 21 times said given diameter of said cord.

3,996,021

METALLIC COATED ARTICLE WITH IMPROVED RESISTANCE TO HIGH TEMPERATURE ENVIRONMENTAL CONDITIONS

David R. Chang, Cincinnati, and John J. Grisik, Middletown, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 521,860, Nov. 7, 1974, Pat. No. 3,951,642. This application Oct. 9, 1975, Ser. No. 621,082

Int. Cl.² B32B *15/20*

U.S. Cl. 29—194 **4 Claims**

1. A metal article based on an element selected from the group consisting of Fe, Co and Ni and including a metallic coating of improved resistance to oxidation and sulfidation, the coating including Hf in the range of 0.1–10 weight percent and the balance Al.

3,996,022

CONVERSION OF WASTE RUBBER TO FUEL AND OTHER USEFUL PRODUCTS

John W. Larsen, Knoxville, Tenn., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 470,862, May 17, 1974. This application Jan. 31, 1975, Ser. No. 546,075

Int. Cl.² C10L *5/48;* **C01G** *1/06*

U.S. Cl. 44—1 D **7 Claims**

1. A process for converting waste solid rubber scrap including used vehicle tires and the like to useful liquid, solid, and gaseous chemicals which consists essentially of:

a. heating at substantially atmospheric pressure a molten acidic halide Lewis salt selected from the group consisting of zinc chloride, tin chloride, antimony iodide, and mixtures thereof, to a temperature range from about 300° C to the respective boiling point of said salt, thereby converting same to a molten state;

b. introducing into said heated molten salt solid waste rubber material for a predetermined time;

c. removing from above the surface of said molten salt the resulting distilled gaseous and liquid products;

d. removing from the surface of said molten salt at least a portion of the resulting carbonaceous residue formed thereon together with at least a portion of said molten salt to separating means wherefrom is recovered as a solid product, said solid carbonaceous material, and wherefrom is recycled back to said molten salt substantially all of the salt material removed therefrom.

3,996,023

AVIATION FUEL CONTAINING DISSOLVED POLYMER AND HAVING REDUCED TENDENCY TO PARTICULATE DISSEMINATION UNDER SHOCK

Desmond Wilfrid John Osmond, Windsor; Norman Douglas Patrick Smith, and Frederick Andrew Waite, both of Farnham Common, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 786,629, Dec. 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 751,992, Aug. 12, 1968, abandoned. This application Apr. 22, 1969, Ser. No. 818,249

Claims priority, application United Kingdom, Dec. 20, 1968, 60720/68; Apr. 11, 1968, 17544/68

Int. Cl.² C10L *1/16*

U.S. Cl. 44—62 9 Claims

1. A liquid hydrocarbon fuel of flash point at least 90° F. and suitable for use in gas turbine engined aircraft, characterized in that it has a reduced tendency to particulate dissemination on being subjected to shock, the fuel containing dissolved therein an addition polymer of ethylenically unsaturated monomer which is soluble in said hydrocarbon fuel and which has a theta temperature lower than −50° C so that the polymer does not precipitate when the fuel is cooled to low temperature in an aircraft, said polymer having a viscosity average molecular weight greater than 10^6 or of intrinsic viscosity greater than 2.5 dls./gm. in a concentration such that there is molecular overlap of the polymer molecules in the liquid.

3,996,024

FUEL COMPOSITION

Marvin D. Coon, deceased, late of Vallejo, Calif., by Phyllis B. Coon, administratrix, Bakersfield, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed June 22, 1973, Ser. No. 372,738

Int. Cl. C10l *1/22*

U.S. Cl. 44—71 8 Claims

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel and from 10 ppm to 1,500 ppm of the salt of a hydrocarbyl-substituted amine, wherein said hydocarbyl substituent contains from 30 to 300 carbon atoms, and an acid selected from formic, carbonic, acetic and lactic acid.

3,996,025

APPARATUS FOR DISTRIBUTING FLOWING MEDIA FROM ONE FLOW CROSS SECTION TO A FLOW SECTION DIFFERENT THEREFROM

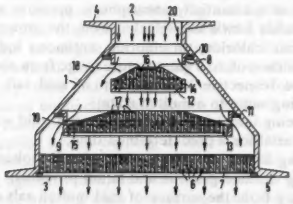
Peter Gulden, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 6, 1975, Ser. No. 602,422

Claims priority, application Germany, Aug. 14, 1974, 2439144

Int. Cl.² B01J *8/02*; B05B *1/14*; C10G *9/04*; F15D *1/02*

U.S. Cl. 48—107 8 Claims



1. Apparatus for distributing flowing media from one flow cross section to another different flow cross section comprising:

a. a tubular enclosure flared in funnel fashion and open at both ends providing a smaller and a wider opening;

b. at least one plate having a multiplicity of parallel passage canals therethrough supported within the tubular enclosure perpendicular to the axis of the tubular enclosure with passage openings having a flow resistance less than said parallel passage canals provided along substantially the entire rim of the plate between said plate and the tubular enclosure, said plate having a thickness which decreases toward its rim; and

c. an end plate having a multiplicity of parallel passage canals filling the wider opening of the tubular enclosure.

3,996,026

PROCESS FOR FEEDING A HIGH SOLIDS CONTENT SOLID FUEL-WATER SLURRY TO A GASIFIER

Edward L. Cole, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 608,115, Aug. 27, 1975, abandoned. This application Feb. 27, 1976, Ser. No. 661,888

Int. Cl.² C10J *3/06*

U.S. Cl. 48—197 R 10 Claims

1. In a process for the gasification of a solid fuel which comprises adding water to a finely-divided solid fuel to form a mixture having a total water content between 35 and 55% by weight, the improvement which comprises adding sufficient organic liquid of a type selected to improve the pumpability of said mixture to the mixture to form a pumpable slurry, heating the resulting slurry under pressure sufficient to maintain the water in liquid phase, separating at least a portion of the organic liquid from the heated slurry and then injecting the remaining mixture into a solid fuel gasification zone.

3,996,027

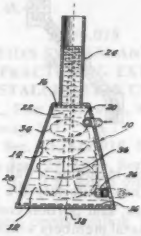
SWIRLING FLOW BUBBLE TRAP

William J. Schnell, Arlington Heights, and Ludwig Wolf, Jr., Barrington, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 31, 1974, Ser. No. 519,731

Int. Cl.² B01D *19/00*

U.S. Cl. 55—36 2 Claims



1. In a method for separating low density materials such as gas bubbles from a liquid utilizing a chamber having an inner side wall defining generally circular, transverse cross sections about its longitudinal axis, said inner wall being generally conical in shape with a lower, wider end and a narrow, upper end, the interior of said chamber being free of flow-restricting baffles, the steps comprising: inserting said bubble-containing liquid into said chamber adjacent said upper end in a direction to pass liquid into said chamber circumferentially about the inner side wall for swirling flow within said chamber, and withdrawing said liquid in a tangential direction from said chamber adjacent the lower end thereof, while simultaneously withdrawing any gas bubbles present from a port positioned adjacent the upper end of the longitudinal axis of said chamber, while keeping said chamber essentially full of liquid, whereby said liquid flows in a spiral vortex flow pattern, in which exterior portions of spirally flowing liquid adjacent said side wall flow downwardly, while interior portions of said

spirally flowing liquid, adjacent said longitudinal axis, flow upwardly to facilitate the removal of gas bubbles.

3,996,028
PROCESS FOR PURIFICATION OF ARGON FROM OXYGEN

Georgy Anatolievich Golovko, Pushkin, bulvar A. Tolstogo, 16, kv. 29; Evgeny Alexandrovich Kharitonov, ulitsa Petra Lavrova, 21, kv. 5, and Jury Yakovlevich Ignatov, ulitsa Kolomenskaya 33/40, kv. 59, all of Leningrad, U.S.S.R.

Filed Dec. 12, 1974, Ser. No. 532,042

Claims priority, application U.S.S.R., Apr. 20, 1974, 2015805

Int. Cl.² B01D *53/04*

U.S. Cl. 55—58 **16 Claims**

1. A process for purification of argon from oxygen comprising the steps of adsorption of oxygen by passing argon under a pressure of 21.38–427 p.s.i.a. through synthetic zeolites of the A type having a diameter of the entry voids from 2.8 to 4.2 A, desorption of oxygen from the zeolites by reducing the pressure from 21.38–427 p.s.i.a. to atmospheric and vacuum treatment of the zeolites to a pressure of $1–10^{-2}$ mm Hg, said steps of adsorption, desorption and vacuum treatment being conducted under a thermostatic treatment of the zeolites with a refrigerant so that the temperature of zeolites at the adsorption stage is maintained at −186° to −133° C.

3,996,029
PURIFICATION OF GASES CONTAINING HYDROGEN FLUORIDE IMPURITY

D. C. Gustafson, Antioch, Calif., and F. D. Skinner, Provo, Utah, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 26, 1975, Ser. No. 616,987

Int. Cl.² B01D *53/00*

U.S. Cl. 55—71 **8 Claims**

1. A method for the removal from gaseous mixtures comprising hydrogen chloride and hydrogen fluoride of the hydrogen fluoride contaminant which comprises bringing said gaseous mixture into contact with liquid sulfur dioxide, thereby removing hydrogen fluoride from said mixture.

3,996,030
FRACTIONATION OF GASES AT LOW PRESSURE

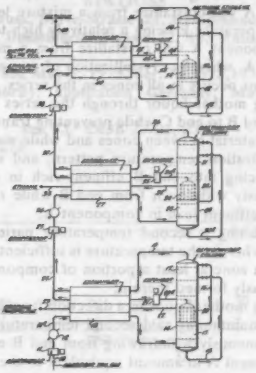
Edward G. Scheibel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Feb. 23, 1976, Ser. No. 660,217

Int. Cl.² F25J *3/02*

U.S. Cl. 62—30 **7 Claims**

1. A process for the separation of hydrocarbon gases by a refrigeration technique which comprises passing a mixture of gases to be separated through a series of staged dual pressure rectification columns each containing a bottom high pressure section, a mid-area high pressure condenser section, and an upper low pressure section, the mixture of gases being compressed in each stage with the heat of compression removed at ambient temperatures and passed through a heat exchanger countercurrent to the low pressure products, feeding the mixture into the bottom of a high pressure column in which the condenser duty is obtained by evaporating liquid in the reboiler of a low pressure column, removing some of the liquid condensate for reflux to the top of said low pressure column, letting the rest of the condensate reflux downward through the high pressure column to be enriched in the higher boiling component by countercurrent flow to the vapor, ultimately passing from the bottom of the high pressure column to an intermediate feed tray in the low pressure column, passing the non-condensible gas from the condenser through an expander and combining it with the overhead vapors from the low pressure column after both these streams and the product stream from the bottom of the low pressure column have been individually heated by exchange against the high pressure feed stream and repeating these operations on the combined overhead product and non-condensible gases to yield products of



successively lower boiling points as the bottoms products from the low pressure columns of the successsive stages.

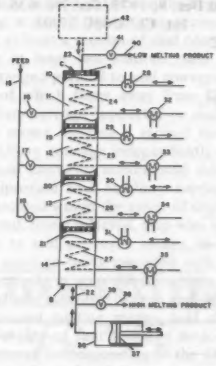
3,996,031
FRACTIONATION OF MULTICOMPONENT DIMETHYLNAPHTHELENES FEEDS BY SELECTIVE CRYSTALLIZATION

Victor M. Chong, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 298,902, Oct. 18, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,752

Int. Cl.² B01D *9/02*; **C07C** *7/14*

U.S. Cl. 260—674 A **8 Claims**



1. A process for separating a preferentially crystallizable dimethylnaphthalene component A from a liquid feed mixture of dimethylnaphthalenes in a fractionating system wherein purification is obtained by crystallization without washing of the crystallized solid, said system having (1) one end B from which component A is removed in liquid phase and another end C from which lower melting component material is removed in liquid phase, (2) a series of crystallization zones between ends B and C, and (3) means for preventing passage of crystallized material between zones, said process consisting essentially of:

a. feeding said feed mixture into the system at a zone removed from end B;

b. establishing a crystallization temperature pattern varying from temperature D at end C to temperature E at end B, temperature D being a relatively low temperature at which component A will crystallize from a mixture lean in component A, temperature E being a relatively high temperature at which component A will crystallize from a mixture rich in component A, whereby crystallization of component A from mother liquor occurs in all zones in the series;

c. flowing mother liquor through the series in a direction from end B to end C while preventing transfer of crystallized material between zones and while maintaining said crystallization temperature pattern, and simultaneously introducing into end B effluent rich in component A previously withdrawn from end B while removing from end C effluent lean in component A;

d. establishing a second temperature pattern along said series wherein the temperature is sufficiently high to melt in each zone at least a portion of component A crystals previously formed therein;

e. flowing mother liquor in a direction from end C to end B while maintaining said second temperature pattern, and simultaneously withdrawing from end B effluent rich in component A in amount equivalent to the mother liquor flow;

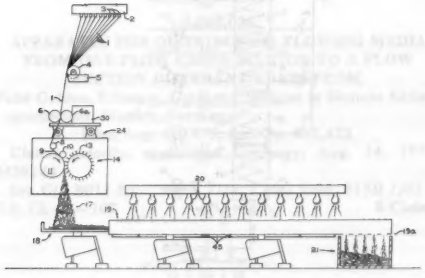
f. and separately removing effluents from each end of the fractionating system.

3,996,032

INSULATED HEATER TRAY FOR MAKING GLASS FIBERS AND METHOD FOR USING SAME

Donald E. McWilliams, Pittsburgh, and William L. Schaefer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 8, 1975, Ser. No. 638,481
Int. Cl.² C03C *37/02*
U.S. Cl. 65—3 C **9 Claims**



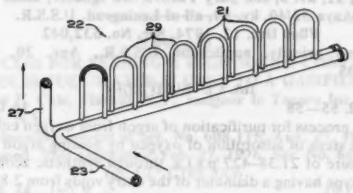
1. In the method of heating and drying chopped glass fibers having a binder and/or size thereon having a tendency to stick to a conveying surface when collected comprising passing said chopped glass fibers onto a 2-stage vibratory conveyor, vibrating a first stage of said conveyor to propel said fibers along the first stage of said conveyor, vibrating a second stage of the conveyor at a lower amplitude than said first stage, heating and drying said fibers during their passage along said conveyor and collecting the resulting fibers, the improvement comprising: insulating said second stage of said conveyor to prevent cold spots along the length of said second stage to thereby prevent sticking of said chopped glass fibers on the surface of said second stage of said conveyor.

3,996,033

METHOD AND APPARATUS FOR CONTROLLING GLASS FIBER COATING

James E. Chickowski, Arnold, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 2, 1976, Ser. No. 673,168
Int. Cl.² C03C *25/02*; C03B *37/02*
U.S. Cl. 65—3 C **9 Claims**



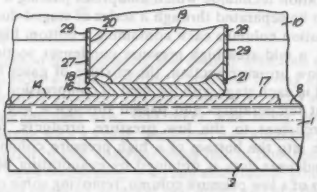
4. In a method of forming glass fibers which comprises pulling glass fibers from molten glass through orifice tips in a bushing, applying a heat curable coating to the filaments, separating said filaments into a plurality of strands by passing said filaments through a plurality of openings in a strand separator, and subsequently passing the strands through a heating zone, the improvement comprising continuously cooling said strand separator by passing a heat transfer fluid through the separator but out of contact with the strand by thereby prevent drying of said heat curable coating on said strand separator surface.

3,996,034

GLASS MANUFACTURING APPARATUS AND PROCESS

Charles Ronald Taylor, St. Helens, and Edward Albert Buckley, Rainhill, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed July 30, 1975, Ser. No. 600,526
Claims priority, application United Kingdom, Aug. 8, 1974, 35075/74
Int. Cl.² C03C *21/00*
U.S. Cl. 65—60 C **28 Claims**



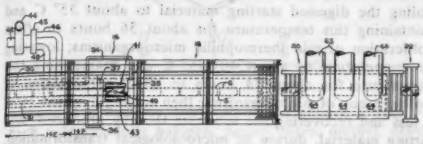
21. An elongated locating member for locating a molten metal body on the upper surface of an advancing ribbon of glass, wherein a lower metallic surface region of the locating member is wettable by the molten metal body, and the configuration of that lower surface region is demarcated, by a coherent coating of a material whose outer surface is not wetted by the molten metal body and which is applied selectively to the surface of the locating member in a manner to define a predetermined configuration of a molten metal body clinging to said wettable metallic surface region.

3,996,035

COATING AND HEAT STRENGTHENING GLASS SHEETS

Donald L. McHenry, Galion, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1975, Ser. No. 618,608
Int. Cl.² C03C 17/00
U.S. Cl. 65—60 C 21 Claims



1. A method of treating a series of discrete glass sheets comprising:

a. conveying a series of discrete glass sheets on a roller conveyor along a straight line path through a heating furnace, a coating station, a reheating station and a cooling station;

b. heating each sheet in turn to a temperature sufficient for a coating composition to react to form a metal oxide coating when it contacts the heated glass sheet surface when said glass sheet is conveyed through said coating station;

c. applying said coating composition to the upper surface of each said glass sheet as the latter passes through said coating station at a temperature sufficient to form a metal oxide coating on said surface, thereby forming said coating on said upper surface and incidentally cooling said sheet to a temperature below a temperature suitable for tempering;

d. reheating each said coated glass sheet sufficiently to raise its temperature to one suitable for tempering but below a temperature at which significant roll ripple distortion results when said sheet passes through said reheating station, and

e. cooling each said sheet from said temperature suitable for tempering at a rate sufficiently rapid to impart at least a partial temper in said sheet as the latter passes through said cooling station.

8. A method of coating a glass sheet moving along a horizontal path comprising applying a coating composition from a source vertically spaced from said path in a direction having a vertical component of motion to a major surface of said glass sheet as it moves between a pair of hot gas curtains disposed in planes normal to said path of glass sheet movement and extending completely across the width of said glass sheet, and applying suction in the direction of said component of coating movement along elongated areas in the vicinity of the opposite longitudinal side edges of said glass sheet along the portion of said path extending between said hot gas curtains to evacuate excess reaction product that results from the application of said coating composition.

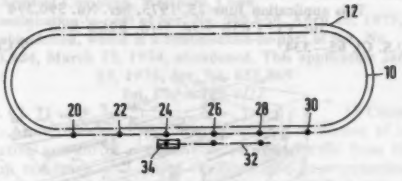
18. Apparatus to coat the upper surface of a series of moving sheets comprising a conveyor comprising a plurality of spaced aligned conveyor rolls defining a substantially horizontal path of travel, spray means disposed above said conveyor for applying a coating composition in a downward direction toward said upper surfaces, said spray means being located within an exposed coating station, said exposed coating station comprising hot air curtains intersecting said conveyor at the upstream and downstreams ends of said coating station to define the upstream and downstream ends of said coating station, and laterally spaced evacuation means constructed and arranged to evacuate fluid downwardly and extending longitudinally of said conveyor in spaced paths parallel to said conveyor path and extending between said hot air curtains to define the lateral sides of said exposed coating station.

3,996,036

APPARATUS FOR MOVING GLASS PANES THROUGH AN INSTALLATION HAVING A PLURALITY OF STATIONS

Gottfried Strauss, Durer-Strasse 24, Heiligenhaus, and Horst Schumann, Dusseldorfer Strasse 72, 403 Ratingen, both of Germany

Filed May 7, 1975, Ser. No. 575,177
Claims priority, application Germany, May 7, 1974, 2421940
Int. Cl.² C03B 23/02, 27/00
U.S. Cl. 65—273 2 Claims



1. An apparatus for moving glass panes in a step-wise manner through a plurality of working stations arranged horizontally one behind the other and having at least a furnace, a bending station and a blowing station; said apparatus comprising: a plurality of carriages, each adapted to removably suspend a glass pane; horizontally extending, endless first guiding means for supporting said carriages and extending over a path including all of said stations; endless conveyor means operating in a first step-wise manner and extending adjacent to and parallel to said endless guiding means over the entire path thereof; means provided at said carriages for connecting the same with said conveyor means; a first stepping drive for moving said conveyor means in a first step-wise manner such that said conveyor means and thereby said carriages come to a rest in an exactly defined position at the beginning and at the end of each step in one of the stations; second guiding means provided along at least a section of said conveyor means and extending over at least two stations, said second guiding means being arranged parallel to said conveyor means and on that side thereof which faces away from said first guiding means; an auxiliary carriage supported on said second guiding means; a drive motor forming a second stepping drive for moving said auxiliary carriage independently of the step-wise movement of said conveyor means; said drive motor being adapted to reciprocate said auxiliary carriage between selected stations located within the range of said second guiding means, in a second, freely selected, step-wise manner between stations relative to said conveyor means, in exactly defined positions; each carriage being provided with two extensions extending respectively in opposite directions, one extending into the range of said conveyor means and the other into the range of said second guiding means; said conveyor means comprising a plurality of first follower devices spaced from each other a distance corresponding to the distance between said stations; each of said first follower devices being adapted to be brought respectively and selectively into engagement with and disengagement from the respective extension; located within the range of said second guiding means and aligned therewith, in each of the stations; said auxiliary carriage being provided with a second follower device adapted to be brought into selective engagement with and disengagement from the respective projection of the respective carriage, located within the range of said second guiding means and aligned therewith, in each of the stations, but opposite to the respective first follower device; said auxiliary carriage being provided with a first actuating device for engaging and disengaging said first follower device with the respective projection of the respective carriage, and with a second actuating device for engagement and disengagement of the second follower

device with the respective projection; a control motor carried by said auxiliary carriage for simultaneously activating said first and said second actuating devices; and time control means for automatically and timely actuating said first stepping drive for said endless conveyor means, of said drive motor for said auxiliary carriage, and of said control motor for activating said first and second actuating devices.

3,996,037

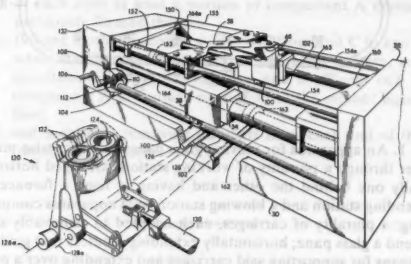
PASS THROUGH SHEARS FOR MOLTEN GLASS FEEDER

Frederick Joseph Wythe, Hebron, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 440,863, Feb. 8, 1974, abandoned. This application June 25, 1975, Ser. No. 590,394

Int. Cl.² C03B *5/38, 5/16;* B26D *5/08*

U.S. Cl. 65—334 **7 Claims**



1. Apparatus for use beneath the outlet spout of a molten glass feeder of the type adapted to form one or more vertical streams of molten glass to be severed, said apparatus comprising:

a. a pair of horizontally opposed double edged shear blades, each of which blades has a leading cutting edge and a trailing cutting edge on the opposite side thereof,

b. a horizontally reciprocal carriage for each of said blades, each of said carriages being movable in a forward direction and also a rearward direction, each carriage having a U-shape with the shear blades supported on the legs of the U and the base of each U being horizontally spaced from said blades so that only the blades pass through the molten glass stream,

c. a shear structure adapted to be mounted to the feeder bowl and having upper and lower sets of guide rails for slidably supporting said carriage legs, the lower carriage legs including spacer means for the lower shear blades whereby the lower and upper shear blades move in closely spaced horizontal paths immediately below the feeder bowl outlet spout,

d. means for reciprocating said carriages in opposite directions so that the leading edge of one blade cooperates with the leading edge of the other blade to sever the molten glass streams generally during the midpoints of the movement of said carriages and so that movement of said carriages in their opposite directions respectively causes the trailing edge of said one blade and trailing edge of said other blade to sever the molten glass stream generally during the midpoint of movement of said carriages.

3,996,038

MUSHROOM GROWING PROCESS

Ernö Tóth; László Tóth, and Imre Heltay, all of Budapest, Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 147,617, May 27, 1971, abandoned. This application Mar. 7, 1974, Ser. No. 448,948

Int. Cl.² C05F *11/00;* A01G *1/04*

U.S. Cl. 71—5 **4 Claims**

1. A process for preparing a substrate for growing mac-

rofungi comprising the successive steps of heating an at least 50% moisture- containing cellulosic starting material, substantially devoid of nitrogen sources, in the presence of air and in the presence of thermophilic microorganisms, to a maximum temperature of about 70° C; maintaining this temperature, a relative humidity of about 100% and aerobic conditions, for about 12 hours, to effect digestion of the starting material; cooling the digested starting material to about 55° C and maintaining this temperature for about 36 hours to effect proliferation of said thermophilic microorganisms; lowering the temperature to about 40°–45° C and maintaining this temperature for about 24 hours to effect proliferation of another group of microorganisms; then cooling to about 25° C or less and recovering the substrate thereby produced, said starting material, during its microbiological transformation, being subjected to substantially no agitation, mixing, or stirring.

3,996,039

SYNERGISTIC HERBICIDAL COMPOSITIONS

Masahiro Aya; Nubuo Fukazawa, and Itsuro Kobori, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 6, 1974, Ser. No. 495,174

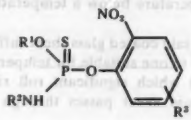
Claims priority, application Japan, Aug. 13, 1973, 48-89986

Int. Cl.² A01N *9/36*

U.S. Cl. 71—87 **15 Claims**

1. Herbicidal composition consisting essentially of as active ingredients effective amounts of

1. an amidothionophosphoric acid ester compound of the formula



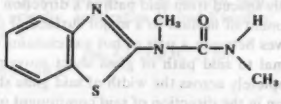
(I)

wherein

R^1 and R^2 are alkyl of from 1 to 6 carbon atoms; and

R^3 is hydrogen or alkyl of from 1 to 6 carbon atoms; and

2. a urea derivative of the formula



(II)

and an inert diluent, the compound I being present in a relative amount to compound II such that the weight ratio of compound I to compound II is 1-2:1.

3,996,040

INCREASING SUCROSE CONTENT OF SUGAR CANE EMPLOYING N-PHENYLSULFONAMIDO-N-PHOSPHONOMETHYL GLYCINE AND CERTAIN DERIVATIVES THEREOF

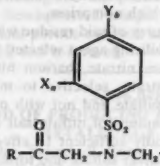
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 484,056, June 28, 1974, Pat. No. 3,910,969. This application June 27, 1975, Ser. No. 591,188

Int. Cl.² A01N *9/36*

U.S. Cl. 71—87 **18 Claims**

1. A method for increasing the sucrose content of grown sugar cane which comprises applying to the cane are effective amount of a compound of the formula



wherein R is hydroxy, lower alkoxy or amino, X and Y are each independently halogen, amino, nitro, methyl, ethyl or methoxy, and a and b are each independently zero or one, said compound being applied to the cane at a time and in an amount effective to increase said sucrose content.

3,996,041

NOVEL AMIDOTH IONOPHOSPHORIC ACID ESTERS AND THEIR USE AS HERBICIDES

Masahiro Aya; Shigeo Kishino; Nobuo Fukazawa, and Toyohiko Kume, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

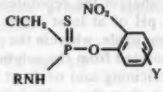
Continuation of Ser. No. 319,079, Dec. 27, 1972, abandoned. This application Apr. 16, 1975, Ser. No. 568,635

Claims priority, application Japan, Dec. 27, 1971, 47-105444

Int. Cl.² A01N 9/36

U.S. Cl. 71—87 **18 Claims**

1. Herbicidal composition comprising a herbicidally acceptable inert carrier and, in effective amounts, an amidothionophosphonic acid ester compound of the formula



(I)

in which

R is alkyl of from 1 to 6 carbon atoms or lower cycloalkyl of from 5 to 6 carbon atoms; and

Y is halogen or alkyl or alkoxy of from 1 to 6 carbon atoms.

3,996,042

SYNERGISTIC HERBICIDAL COMPOSITIONS

Herbert Goeldner, Hallgarten; Robert Rudolf Schmidt, Cologne, and Carl Metzger, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 31, 1975, Ser. No. 545,937

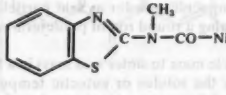
Claims priority, application Germany, Feb. 1, 1974, 2404979

Int. Cl.² A01N 9/12

U.S. Cl. 71—90 **8 Claims**

1. Herbicidal composition containing, in herbicidally effective amounts, as active ingredients

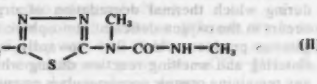
1. 3-(benzthiazol-2-yl)-1,3-dimethyl-urea of the formula



(I)

and

2. 3-(5-n-butylsulphonyl-1,3,4-thiadiazol-2-yl)-1,3-dimethyl-urea of the formula



(II)

in a ratio of compound (I) to compound (II) of 1:0.5 to 1:1.

3,996,043

TRIAZINE—ANTIDOTE COMPOSITIONS AND METHODS OF USE FOR COTTON

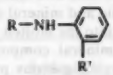
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 566,658, April 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 450,924, March 13, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,869

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 **13 Claims**

1. An herbicide composition comprising a mixture of an effective amount of a triazine herbicide selected from the group consisting of 2-chloro-4-ethylamino-6-isopropylamino-s-triazine and 2-(4-chloro-6-ethylamino-s-triazin-2-yl-amino)-2-methylpropionitrile, and an antidote compound therefor corresponding to the formula



in which R is tetrahydromonophthaloyl, halomonophthaloyl in which halo is chlorine or bromine from 1 to 4, inclusive, and monophthaloyl and R′ is hydrogen or fluorine; from about 0.01 to about 15 parts by weight of antidote compound for each part by weight of the triazine herbicide.

3,996,044

ELECTRO-PYROLYTIC UPRIGHT SHAFT TYPE SOLID REFUSE DISPOSAL AND CONVERSION PROCESS

Josef Peter Petritsch, Glen Iris, Australia, assignor to Intercont Development Corporation Pty. Ltd., Melbourne and Plant-Fab Construction & Installations Pty. Ltd., Morwell, both of Australia

Filed Jan. 10, 1975, Ser. No. 540,272

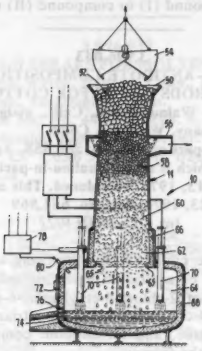
Claims priority, application Australia, Jan. 23, 1974, 6345/74

Int. Cl.² C22D 7/00

U.S. Cl. 75—10 R **7 Claims**

1. A process for treating waste materials containing moisture and metallic, mineral and organic components at least some of which contain vaporizable or volatile constituents, said process comprising: maintaining a molten electrically conductive pool of metal and mineral components in a furnace chamber located in the lower end of an upright shaft furnace by passing an electric arc between the pool and at least one electrode so as to heat the chamber to at least 1600° C; supplying the waste materials to the upper end of an upright shaft which has a lower end in communication with the furnace chamber at a location above the surface of the pool, said shaft having a gas outlet located above its lower end, said furnace chamber and the portion of said shaft below the gas outlet being substantially sealed from the outside atmosphere so that an oxygen deficient atmosphere exists in the chamber and in said shaft; passing heat from the chamber into the lower end of said shaft and upwardly therethrough while passing the waste materials downwardly through said shaft so that the temperature of the waste materials is progressively increased as the waste materials descend through the shaft, the waste materials undergoing in sequence as they descend a pre-drying treatment during which at least some vaporizable or volatile

constituents and moisture are driven off, a pyrolytic treatment during which thermal degradation of organic components occurs in the oxygen-deficient atmosphere thereby producing gaseous products which flow upwardly in said shaft and a sintering and smelting reaction during which gasification of any remaining organic components is essentially completed so



that essentially only metallic and mineral components remain; and passing the metallic and mineral components through the lower end of the shaft into the molten pool; discharging excess molten metallic and mineral components from the furnace chamber; and discharging gaseous products from said shaft through the gas outlet at a location above the location of the pyrolysis reaction.

3,996,045

METHOD FOR PRODUCING HIGH-GRADE FERRO-NICKEL DIRECTLY FROM NICKELIFEROUS OXIDE ORES

Kotaro Ishii, Shibata, Japan, assignor to Pacific Metals Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 381,559, July 23, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,583
Claims priority, application Japan, Sept. 1, 1972, 47-87175
Int. Cl.² C21C *5/52*
U.S. Cl. 75—11 **5 Claims**

1. A method for producing high-grade ferro-nickel containing 0.4 to 5% of sulfur directly from nickel-containing oxide ores which comprises adding at least one member selected from the group consisting of high-sulfur fuels, elemental sulfur, gypsum, pyrites, nickel sulfide ores, low grade coals and high-sulfur waste material produced during desulfurization of steels and ferro alloys to the nickel-containing oxide ore in an amount sufficient to provide a sulfur addition of 0.1 – 3 kilograms per ton of dry ore, treating the resultant mixture in a pre-reducing furnace or calcining furnace, and smelting the thus treated mixture in an electric furnace to obtain ferro-nickel containing 0.4 to 5% of sulfur.

3,996,046

EXTRACTION AND PURIFICATION OF SILVER FROM SULFATES

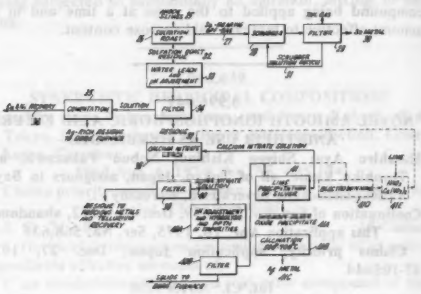
James E. Hoffmann, Berkeley Heights; Peter D. Parker, Edison, and Andrew C. Sabo, Perth Amboy, all of N.J., assignors to Amax Inc., New York, N.Y.

Filed July 25, 1975, Ser. No. 599,868
Int. Cl.² C22B *7/00, 11/04;* **C25C** *1/20*
U.S. Cl. 75—99 **27 Claims**

10. A process of extracting silver from anode slimes containing silver and at least one of the elements selected from the group consisting of Cu, Ni, Fe, Te, Pb, Se, As, Bi, Sn, Sb and precious metals, wherein said slimes are subjected to a sulfating roast and the sulfated slimes leached to form an aqueous solution of soluble sulfates and leave a silver sulfatecontaining residue which comprises,

forming an aqueous slurry of said residue with a solution of a metal nitrate solubilizing agent selected from the group consisting of calcium nitrate, barium nitrate, stontium nitrate and lead nitrate, selective to methatetical exchange with silver sulfate and not with other metal sulfates present, the amount of nitrate salt added being at least stoichiometrically sufficient to effect metathetical exchange with said silver sulfate and form a silver nitrate solution containing substantially the silver originally present in said residue,

separating the residue remaining from said silver nitrate solution,



adjusting said solution to a pH not exceeding that value at which basic silver hydrous oxide precipitates but sufficient to precipitate impurities therein by hydrolysis, and then separating said silver nitrate solution from said precipitate.

11. The process of claim **10**, wherein the separated silver nitrate solution is adjusted to a pH of at least about 8 and thereby precipitating silver hydrous oxide, wherein the precipitated silver hydrous oxide is separated from the solution and decomposed to silver metal by calcining said oxide at a temperature of over 300° C and less than the melting point of silver.

14. The process of claim **10**, wherein the silver in said separated silver nitrate solution is recovered by electrolysis.

3,996,047

METHOD AND MOLD FOR PRODUCING ROUND RODS BY POWDER METALLURGY

Harbhajan S. Nayar, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 7, 1974, Ser. No. 449,114
The portion of the term of this patent subsequent to Jan. 14, 1992, has been disclaimed.
Int. Cl.² B22F *3/00, 3/10*
U.S. Cl. 75—200 **1 Claim**

1. A method of producing metallic stock by powder metallurgy comprising the steps of providing a mold of predetermined geometry, introducing a particle mass into the mold cavity, heating the particle mass in said mold and allowing said particle mass to cool to form said metallic stock, the improvement comprising:

a. introducing said particle mass by placing the precise amount of uncompacted powder as said particle mass in the mold for forming a round rod of predetermined diameter; and

b. heating the particle mass to sinter said mass in a first stage at approximately the solidus or eutectic temperature of said particle mass for up to about one hour to permit gaseous products to escape through an interconnected porous network and in a second stage at a temperature above the solidus or eutectic temperature of said particle

mass until at least 75% liquid phase is formed with surface tension causing the top portion of said particle mass to attain a hemispherical shape substantially without vestiges of said porous network such that upon said cooling said round rod is formed.

3,996,048

METHOD OF PRODUCING HOLES IN POWDER METALLURGY PARTS

Louis J. Fiedler, Trumbull, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Oct. 16, 1975, Ser. No. 623,154
Int. Cl.² B22F 3/00
U.S. Cl. 75—208 R 6 Claims

1. A powder metallurgy process for producing fully consolidated articles which exhibit substantially 100% theoretical density and which are provided with bores or other internal passages, which process includes:

preparing a replica of the desired passages from thin walled metal tubing filled with a leachable refractory oxide,

positioning said replica in a mold having a cavity defining the shape of the desired article,

filling the mold cavity with metal powder to be consolidated around the replica to form an unconsolidated composite,

hot isostatically pressing the composite whereby the powder and tube become bonded to one another,

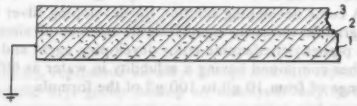
and leaching the refractory oxide from the tubes in the consolidated article.

3,996,049

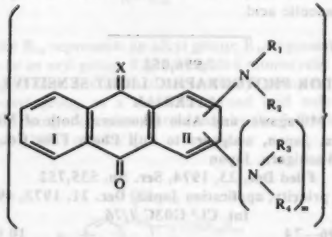
DUAL LAYER ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Jürgen Rochlitz, Breckenheim, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 354,200, April 25, 1973, abandoned. This application May 15, 1975, Ser. No. 577,952
Claims priority, application Germany, Aug. 30, 1972, 2242596
Int. Cl.² G03G 5/06
U.S. Cl. 96—1.5 9 Claims



1. Electrophotographic recording material comprising an electroconductive support material and a photoconductive double layer of organic materials which is composed of a tightly packed, homogeneous, uniform, opaque, charge carrier producing dyestuff layer having a thickness from about 0.005 to about 2 mm prepared by vacuum evaporation of a compound corresponding to the general formula



wherein

m is 0 or 1,

n is 1 or 2,

X is oxygen or imino nitrogen (=N—),

R_1 and R_3 which may be the same or different, are hydrogen, an alkyl group with 1 to 4 carbon atoms, an anthraquinone or benzanthrone group, or —CO—NH—R_5, with R_5 being an anthraquinone group,

R_2 and R_4 which may be the same or different, are hydrogen or a single bond directed to the position of a radical in R_1 or R_3, or a single bond which, together with the imino nitrogen, forms part of a pyrazole or pyrimidine ring, and R_1 and R_3 also may form a single C-C bond with one of the rings I or II of the general formula, thus resulting in a pyrrole structure, a dimeric compound with a ring-C—C— bond being formed when $n = 2$, and wherein

one or more rings may be substituted by the same or different alkyl groups with 1 to 4 carbon atoms, alkoxy groups with 1 to 4 carbon atoms, or halogen groups,

and of a transparent top layer of insulating material having a thickness from about 5 to about 20 mm and containing at least one charge transporting compound, in which the transparent top layer is composed of a mixture of a charge-transporting monomeric heterocyclic compound with at least one substituted amino group and having an extended π-electron system, which is selected from the group of oxazoles, oxadiazoles, triazoles, imidazoles and pyrazoles, and a binder in a ratio by weight of about 1 : 1,

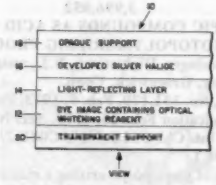
which recording material is useful in an electrophotographic copying process with negative charging of the top layer.

3,996,050

WHITENING AGENTS IN COLOR DIFFUSION TRANSFER FILM UNITS

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 463,264, April 23, 1974, abandoned. This application Dec. 26, 1974, Ser. No. 536,434
Int. Cl.² G03C 7/00, 1/40, 1/84, 5/54
U.S. Cl. 96—3 41 Claims



1. In a photographic film unit adapted for forming a color transfer image viewable as a reflection print including a photosensitive component comprising at least one light-sensitive silver halide layer having a dye image-providing material associated therewith, an image-receiving component including at least a dye image-receiving layer carried on a transparent support, and means for providing a reflecting layer between said photosensitive and image-receiving components in an amount sufficient after development of said film unit to mask effectively said photosensitive component and to provide a background for viewing a color transfer image by reflected light;

the improvement which comprises including in said film unit as a non-fluorescent optical whitening reagent a dye developer positioned initially in said image-receiving component in said dye image-receiving layer or a layer between said dye image-receiving layer and said transparent support and substantially non-diffusible from said image-receiving component, said whitening reagent being capable of absorbing visible light within a predetermined wavelength range complementary to the wavelength range absorbed by a colored stain formed during aging of

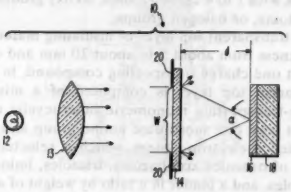
said color transfer image and being present in a concentration such that the light reflected from the D_{min} areas of said transfer image visually appears substantially white after aging.

3,996,051

CONTROLLED ANGLE VIEWING SCREENS BY INTERFERENCE TECHNIQUES

Dietrich Meyerhofer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 446,417, Feb. 27, 1974, Pat. No. 3,909,111. This application May 29, 1975, Ser. No. 581,730
Int. Cl.² G03C 5/24
U.S. Cl. 96—27 E 7 Claims



1. A method for producing a controlled angle viewing screen by interference techniques, said method comprising the step of:

exposing a hardened, sensitized gelatin film with incident light which has been passed through an area of a diffusing medium having a given linear dimension which medium is located at a given distance from said film such that said given linear dimension subtends a preselected angle in the range of 15° to 40° on said film, said incident light being coherent to the extent that all the light impinging on any given point of said film has a substantially fixed phase relationship.

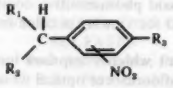
3,996,052

PHOTOTROPIC COMPOUNDS AS ACID CATALYST IN PHOTOPOLYMERIZING PROCESS

Sheldon I. Schlesinger, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 331,179, Feb. 9, 1973, Pat. No. 3,895,952. This application Feb. 26, 1975, Ser. No. 553,260
Int. Cl.² G03C 5/00; C08F 2/46
U.S. Cl. 96—35.1 12 Claims

1. A process of photopolymerizing a material polymerizable to higher molecular weight by cationic polymerization, comprising: forming a mixture of (1) a monomeric or prepolymeric epoxide material, selected from the group consisting of glycidyl ethers of bisphenol A, epoxy-cycloalkanes, epoxy-cycloalkenes, epoxy-alkanes, glycidyl alkyl ethers, epoxy-novolacs and allyl glycidyl ether-glycidyl methacrylate copolymer with (2) a phototropic aromatic compound containing at least one nitro radical in a position ortho to an alkyl substituent selected from compounds having the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, aryl, carbalkoxy, pyridyl, carbazolyl, N-oxidopyridyl, nitroalkyl, nitroaryl, dinitrophenyl, alkaryl, aralkyl, haloalkyl and haloaryl radicals and R_3 is selected from the group consisting of hydrogen, alkyl, aryl, nitroalkyl, nitroaryl, alkaryl, aralkyl, haloalkyl, haloaryl radicals and electron-withdrawing groups selected from $—NO_2$, —CN, —COOR, —COR, $—NR_3$, —BR, —Cl, —F, —I, —RCOX, $—RX_3$, —NO, RCO—and R_2NCO— wherein X is halogen and R is alkyl;

and subsequently exposing the resulting mixture to sufficient actinic or electron beam radiation to activate said phototropic compound to an acid form effective to initiate polymerization of said epoxide material.

3,996,053

PHOTOSENSITIVE COMPOSITION CONTAINING A MIXTURE OF CADMIUM IODIDE AND CUPROUS IODIDE

Thomas William Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 21, 1975, Ser. No. 597,782
Int. Cl.² G03C 1/00, 5/24
U.S. Cl. 96—48 R 17 Claims

1. A photosensitive composition consisting essentially of a mixture of cadmium iodide and cuprous iodide in a binder for the mixture.

11. In the process comprising imagewise exposing an element comprising a support having thereon a non-silver photosensitive composition to irradiation and subsequently developing an image by contacting the exposed element with a chemical developer containing a reducing agent for cadmium iodide and cuprous iodide, the improvement comprising using as the non-silver photosensitive composition, a mixture consisting essentially of cadmium iodide and cuprous iodide in a binder therefor.

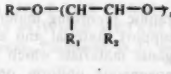
3,996,054

COLOR PHOTOGRAPHIC DEVELOPING SOLUTION

Hector J. Santemma, and Richard S. Fisch, both of Montgomery, N.Y., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 183,675, Sept. 24, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,666
The portion of the term of this patent subsequent to Jan. 15, 1991, has been disclaimed.
Int. Cl.² G03C 5/30, 7/16
U.S. Cl. 96—66 R 6 Claims

1. A color developing solution for developing silver halide photographic elements comprising in aqueous alkaline solution a p-phenylenediamine color developing agent and a glycol ether compound having a solubility in water at 60° C. in the range of from 10 g/l to 100 g/l of the formula



wherein R is a $C_1 - C_{10}$ alkyl group or an aryl group having no more than 10 carbon atoms, R_1 and R_2 each independently represent a hydrogen atom or a $C_1 - C_3$ alkyl group with the proviso that at least one of R_1 and R_2 is hydrogen, and n is an integer of from 1 to 5, in the substantial absence of ethylenediaminetetraacetic acid.

3,996,055

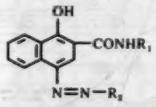
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yoshisato Minagawa, and Akio Okumura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 23, 1974, Ser. No. 535,752
Claims priority, application Japan, Dec. 21, 1973, 49-3113
Int. Cl.² G03C 1/76
U.S. Cl. 96—74 10 Claims

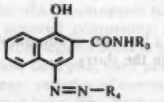
1. A color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion and the light-sensitive material containing a colored cyan

coupler having a main absorption in the blue region of the spectrum, a colored cyan coupler having a main absorption in the green region of the spectrum, and a colorless cyan coupler, each coupler being capable of coupling with an oxidation product of a p-phenylenediamine color-developing agent to form a cyan dye and being present in a red-sensitive silver halide emulsion layer, said colored cyan coupler having a main absorption in the green region of the spectrum being a coupler represented by the following general formula (I)



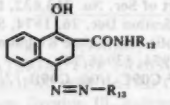
(I)

wherein R_1 represents an aryl group; R_2 represents an aryl group having at least one of an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylcarbonyl group or an arylcarbonyl group as a substituent; or the following general formula (II)



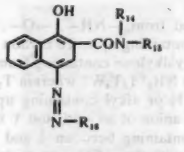
(II)

wherein R_3 represents an alkyl group; R_4 represents a monocyclic aryl group containing an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylcarbonyl group or an arylcarbonyl group at the o-position with respect to the azo group; said colored cyan coupler having a main absorption in the blue region of the spectrum being a coupler repesented by the following general formula (VII)



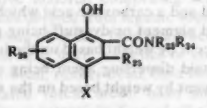
(VII)

wherein R_{12} represents an alkyl group; and R_{13} represents a monocyclic aryl group having an alkoxycarbonyl group or aryloxycarbonyl group at the m- or p-position with respect to the azo group; or the general formula (VIII)

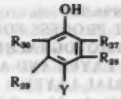


(VIII)

wherein R_{14} represents an alkyl group; R_{15} represents an alkyl group or an aryl group; R_{16} represents a monocyclic aryl group having at least one of an alkoxycarbonyl group or an aryloxycarbonyl group as a substituent; and said colorless cyan coupler being a coupler represented by the following general formula (XIV) or (XV)



(XIV)



(XV)

wherein R_{23} and R_{24} each represents a hydrogen atom, an alkyl group, a cyclic alkyl group, an aryl group, a heterocyclic group, or in combination the non-metallic atoms necessary for forming a heterocyclic ring; R_{27} represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a carbamyl group, or a ureido group; wherein R_{25}, R_{26}, R_{28} R_{29} and R_{30} each represents the groups as described with respect to R_{27} and further represents a halogen atom or an alkoxy group; X and Y each represents a hydrogen atom, or a group capable of being eliminated on coupling with the oxidation product of an aromatic primary amine developing agent or X is a cyclic imido group or a residue capable of releasing a restrainer upon development.

3,996,056

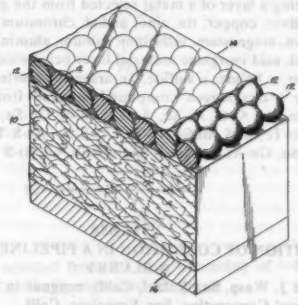
DIAZOTYPE REPRODUCTION LAYER FORMED FROM MATRIX OF SPHERIC PARTICLE POLYSTYRENE PIGMENT AND DIAZOTYPE COMPONENTS

Peter Muller, Port Washington, N.Y., assignor to Andrews Paper & Chemical Co., Port Washington, N.Y.

Continuation-in-part of Ser. No. 349,817, April 10, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,206

Int. Cl.² G03C 1/60, 1/78

U.S. Cl. 96—75 **10 Claims**



1. A diazo reproduction material having wide printing latitude, which comprises:

a base sheet having applied on at least one surface thereof, a coating of diazotype components comprising a light-sensitive compound selected from the group consisting of a diazonium compound and a water soluble naphthoquinone diazide in a matrix prepared from spheric polystyrene particles; said particles having a size of from about 0.15 to about 0.7 microns; said application including bonding said particles together by using a polymer binder in said coating and affixing them to said base sheet; and said coating being applied so that there is from about 4 to about 10 gms of polystyrene per square meter of base sheet.

3,996,057

HEAT DEVELOPMENT PROCESS FOR FORMING IMAGES UTILIZING A PHOTOGRAPHIC MATERIAL CONTAINING A METAL LAYER AND AN INORGANIC MATERIAL LAYER

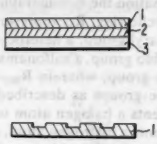
Kazuhiro Kawaziri; Yuzo Mizobuchi, and Takeshi Tomotsu, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 422,487, Dec. 6, 1973, abandoned. This application Dec. 23, 1975, Ser. No. 643,653

Claims priority, application Japan, Dec. 7, 1972, 47-123130

Int. Cl.² G03C *5/24*

U.S. Cl. 96—484 D **4 Claims**



1. A method for forming an image, which comprises imagewise irradiating with electromagnetic radiation of a wavelength of about 2,000 A to 1 μ, a multi-layer image-recording material comprising a metal layer and an inorganic material layer in contact with said metal layer and capable of forming an interreaction product with said metal layer, so that the non-irradiated areas of said metal layer become thermally dopable at a temperature lower than the temperature for thermally doping the irradiated areas of said metal layer, upon irradiation with said electromagnetic radiation of a wavelength of about 2,000 A to 1 μ, and then heating said material to a temperature to cause diffusion of said metal in the non-irradiated areas into said inorganic material layer, said metal remaining unchanged and undoped after said heating at the areas irradiated with said electromagnetic radiation, said temperature being 70° to 300° C and not causing complete diffusion of metal from said irradiated metal areas, said metal layer being a layer of a metal selected from the group consisting of silver, copper, tin, zinc, nickel, chromium, manganese, cadmium, magnesium, tellurium, gallium, aluminium, bismuth and gold, said inorganic material layer being elemental sulfur, selenium, a halide, a sulfide, an arsenide, a selenide, a telluride, or a chalocogen compound selected from the group consisting of As-S, As-Se, As-Te, Ge-S, Ge-Se, S-Se, Sb-Se, Sb-S, Sb-Te, Bi-S, Bi-Se, Bi-Te, As-S-Se, As-S-Te, As-Se-Te, Ge-As-Se, Ge-As-Te, Ge-P-S, Ge-Al-S, Ge-Bi-S or Ge-Sb-S.

3,996,058

INHIBITION OF CORROSION IN A PIPELINE CARRYING A SLURRY

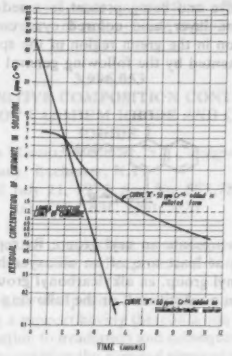
Edward J. Wasp, San Rafael, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 487,964, July 12, 1974, abandoned, which is a continuation of Ser. No. 341,164, March 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 110,556, Jan. 28, 1971, abandoned. This application July 28, 1975, Ser. No. 599,708

Int. Cl.² C23F *11/08*

U.S. Cl. 106—14 **2 Claims**

1. The method of inhibiting corrosion in a steel pipeline used to transport an aqueous slurry of solid coal particles, consisting essentially of placing a chromate salt having a low water solubility in an inert carrier and forming the carrier and chromate salt mixture into pellets, placing the pellets into a pipeline containing an aqueous slurry of solid coal particles, thereby permitting the slow release of the chromate from the pellets as the pellets are transported with the slurry such that the concentration of hexavalent chromium ion in the slurry at no time exceeds about 7 ppm, thus resulting in a high rate of oxygen depletion and a low rate of consumption of chromate by the solid particles in the slurry.



3,996,059

DISPERSING AGENTS

James Frederick Stansfield, and Arthur Topham, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 313,632, Dec. 11, 1972, abandoned. This application Dec. 26, 1974, Ser. No. 536,479

Claims priority, application United Kingdom, Dec. 30, 1971, 60731/71; Dec. 13, 1974, 53946/74

Int. Cl.² C09C *3/00;* **C09D** *17/00*

U.S. Cl. 106—308 N **5 Claims**

1. A composition of matter consisting essentially of a finely divided dispersion of a solid pigment or dyestuff having a particle size of less than 25 microns in a liquid hydrocarbon or chlorinated hydrocarbon containing dissolved therein a dispersing agent of the formula

$$Y - CO - B - A - R$$

wherein B is selected from —NH—, —O—, and $-NT_1-$, wherein T_1 is alkyl containing up to 20 carbon atoms and A is alkylene or β-hydroxyalkylene containing from 2 to 6 carbon atoms, R is NT_2T_3 or $NH_2^+T_3T_4W^-$ wherein T_2, T_3 and T_4 are each independently H or alkyl containing up to 20 carbon atoms and W^- is the anion of an acid, and Y is the residue of a polyester chain containing between 2 and 10 monomeric units which together with the —CO— group is derived from a hydroxycarboxylic acid of the formula

$$HO - X - COOH$$

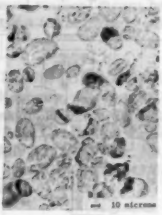
wherein X is a divalent saturated or unsaturated aliphatic radical containing between 8 and 20 carbon atoms and in which there are at least 4 carbon atoms between the hydroxy and carboxylic acid groups or from a mixture of such a hydroxycarboxylic acid and a carboxylic acid which is free from hydroxy groups, said pigment or dyestuff being present in an amount of 5–70 percent by weight based on the total weight of the dispersion and said dispersing agent being present in an amount of 5–50 percent by weight based on the weight of said pigment or dyestuff.

3,996,060

STILT MATERIAL FOR PRESSURE SENSITIVE MICROENCAPSULATED COATINGS

Donald L. Johnson, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed June 10, 1974, Ser. No. 477,951
Int. Cl.² B01J 13/00; C13L 1/08; D21H 3/28
U.S. Cl. 127—29 15 Claims



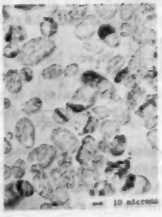
1. A protective material disposed between adjacent surfaces to prevent transfer of a chromogenic substance therebetween, said protective material comprising large diameter starch granules derived from legume sources selected from the group consisting of yellow field pea, shell pea, Chickling pea, wrinkled pea, faba bean, varieties of common bean, French bean, kidney bean, runner bean, lima bean, adzuki bean, jack bean, cultivated vetch, moon bean and lentil, said starch granules having an average size ranging from about 20–75 microns, and having a friction staining value of at least 85 and a typewriter intensity value of 55 or less, said starch granules having been further modified, either physically or chemically, or both to improve physical properties including decrease in odor, improvement in color, and removal of non-starch materials from the large diameter starch granules.

3,996,061

STILT MATERIAL FOR PRESSURE SENSITIVE MICROENCAPSULATED COATINGS

Donald L. Johnson, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 477,951, June 10, 1974. This application July 2, 1975, Ser. No. 592,450
Int. Cl.² B01J 13/00; C13L 1/08; D21H 3/28
U.S. Cl. 127—29 23 Claims



1. A protective material disposed between adjacent surfaces to prevent transfer of a chromogenic substance therebetween, said protective material comprising refined large diameter starch granules derived from legume sources selected from the group consisting of yellow field pea, shell pea, Chickling pea, wrinkled pea, faba bean, varieties of common bean, French bean, kidney bean, runner bean, lima bean, adzuki bean, jack bean, cultivated vetch, moon bean and lentil, said starch granules being substantially free of all protein and fiber residue, said starch granules having an average size ranging from about 20–75 microns, and having a friction staining value of at least 85 and a typewriter intensity value of 55 or less, said starch granules having been further modified either physically or chemically, or both, to improve physical properties including decrease in odor, improvement in color and removal of non-starch materials from the granules to adapt such granules for use as a protective material.

3,996,062

METHOD FOR REMOVING SCALE FROM METALLIC SUBSTRATES

Jack G. Frost; Larry D. Martin, and William P. Banks, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

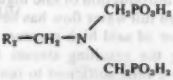
Filed Aug. 28, 1975, Ser. No. 608,823
Int. Cl.² C23G 1/00
U.S. Cl. 134—2 11 Claims

1. A method for removing iron-containing scale from metal substrates having copper or a copper-containing scale thereon while avoiding the formation of a precipitate comprising contacting for a period of at least one hour, at a temperature of from about 110° F to about 175° F, and at a pH of from about 7 to about 8, the scale bearing substrate with an aqueous solution consisting essentially of water, and from about 0.5 weight percent to about 3.5 weight percent of at least one compound selected from the class consisting of polyphosphonic acids (1) and (2), the amine salts of said polyphosphonic acids and the alkali metal salts of said polyphosphonic acids, acids (1) and (2) being structurally defined as follows:

(1)

where R_1 is selected from the class consisting of C_1–C_{12} alkyl groups, and the group

and


(2)

where R_2 is selected from the class consisting of —H—, —PO_3H_2, C_1–C_{12} alkyl groups, and the group

and

in the course of said contacting, circulating the aqueous solution to attain a total effective volumetric quantity thereof in contact with the substrate to maintain maximum iron concentration of said solution at less than about 1.0 weight percent;

wherein said method is further characterized in including the subsequent steps of:

adjusting the temperature of the aqueous solution to

bring the aqueous solution to a temperature in the range of from about 140° F to about 175° F;

adding an effective amount of a buffering compound to adjust the pH of the aqueous solution to at least 9.0;

adding an oxidant compound to the aqueous solution in an amount effective to oxidize all ferrous ions present in the solution to ferric ions, and all copper contacted by the solution to cupric ions; and

after said addition, maintaining contact between said solution and said scale-bearing substrate for a period of time sufficient to remove adhered copper from the substrate.

3,996,063

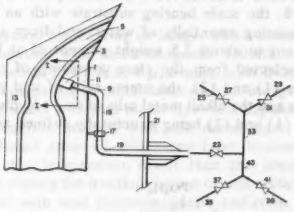
METHOD FOR REMOVING COKE FROM FLUID COKER OUTLETS

Arthur C. Worley, Morristown, and Paul S. Fabian, Millburn, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 3, 1975, Ser. No. 538,360

Int. Cl.² B08B *3/00*

U.S. Cl. 134—22 C **13 Claims**



1. A decoking process for removing coke from a vapor outlet passage for products from a coking process, said decoking process being conducted while said coking process is in operation, which comprises:

a. continuously flowing a stream of relatively low pressure steam in a confined path;

b. introducing said stream into said vapor outlet passage;

c. introducing a stream of high pressure steam into said path of step (a), and passing the combined streams of steps (a) and (c) into said vapor outlet passage;

d. introducing gradually a stream of high pressure water into said path of step (a), and passing the combined streams of steps (c) and (d) into said vapor outlet passage;

e. discontinuing the introduction of said high pressure steam into said path when full water flow has been reached, and

f. continuing the flow of said high pressure water into said path and passing the resulting stream into said vapor outlet passage for a time sufficient to remove by thermal spalling at least a portion of said coke from said vapor outlet passage.

3,996,064

ELECTRICALLY RECHARGEABLE REDOX FLOW CELL

Lawrence H. Thaller, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 22, 1975, Ser. No. 606,891

Int. Cl.² H01M *10/44*, *10/00*

U.S. Cl. 320—2 **11 Claims**

1. An electrical energy storage system for supplying electrical power to a load, comprising:

an electrochemical cell divided into two compartments by an ion selective membrane;

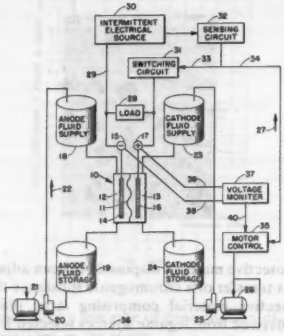
first and second electrodes disposed in respective first and second ones of said two compartments;

means for connecting said load to said electrodes;

means for flowing an anode fluid through said first compartment;

means for flowing a cathode fluid through said second compartment;

means for applying a charging voltage to said electrodes while said anode and cathode fluids are flowing to recharge said fluids, said electrodes being inert to the respective anode and cathode fluids, said membrane being substantially impermeable to all but chloride ions,



said means for applying a charging voltage being a source of noncontinuous electrical power;

switching means interposed between said source of noncontinuous electrical power and said load; and

sensing means for opening said switching means to disconnect said source from said load when the voltage of said source is below a predetermined magnitude.

3,996,065

VEHICLE STORAGE BATTERY CELL

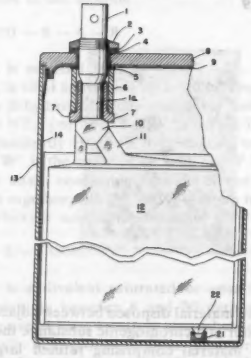
Gerwin Trippe, Gevelsberg, and Jürgen Brinkman, Hagen, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Sept. 23, 1974, Ser. No. 508,638

Claims priority, application Germany, Nov. 12, 1973, 2356465

Int. Cl.² H01M *10/16*

U.S. Cl. 429—208 **8 Claims**



1. A storage battery cell having positive and negative plate stacks within a housing with a lid, said stacks having pole bolts protruding through the lid, and plate rests extending down from the bottoms of the plates within the housing, said cell being characterized by:

first resilient means engaging the lid and the pole bolts to support the plate stacks partly from the lid of the housing; and

second resilient means to support the plate stacks partly from the bottom of the housing,

the second resilient means including a resilient pedestal upstanding from the housing bottom, and having a recess into which a plate rest is partially inserted, the recess having inner sides with converge at a more acute angle than the sides of the inserted plate rest, and

the first and second resilient means being positioned diagonally with respect to the battery plates.

3,996,066

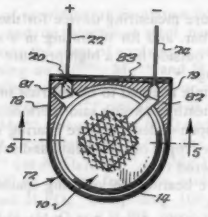
LITHIUM-IODINE BATTERY

Ralph T. Mead, Kenmore; Norbert W. Frenz, North Tonawanda, and Frank W. Rudolph, Depew, all of N.Y., assignors to Eleanor & Wilson Greatbatch Foundation, Akron, N.Y.

Filed July 22, 1975, Ser. No. 597,975

Int. Cl.² H01M *43/00*

U.S. Cl. 429—185 **18 Claims**



1. A lithium-iodine cell comprising:

a. a first container element having a solid body portion defining an interior region therein, an opening communicating with said region, a continuous peripheral flange around said opening extending outwardly from said body portion, and a continuous internal flange extending inwardly from said body portion into the interior thereof, said container being of a material which is heat sealable and does not exhibit electronic conduction when exposed to iodine;

b. a second container element having a solid body portion defining an interior region therein, an opening communicating with said region, a continuous peripheral flange around said opening extending outwardly from said body portion, and a continuous internal flange extending inwardly from said body portion into the interior thereof, said container being of a material which is heat sealable and does not exhibit electronic conduction when exposed to iodine;

c. said first and second containers being juxtaposed to define an assembly with the peripheral flanges of said containers being in contact and the interior regions of said containers defining a single closed chamber in the assembly;

d. lithium anode means held in said chamber by said container elements, said anode means comprising first and second lithium elements in said first and second container elements, respectively, and extending along the interior region thereof;

e. electrical conductor means operatively connected to said lithium anode means and extending from said assembly;

f. cathode means comprising iodine-containing material in said chamber and operatively contacting said lithium anode means;

g. electrical conductor means operatively connected to said cathode means and extending from said assembly;

h. said peripheral flanges of said holders being heat sealed together and the resulting sealed flange extending outwardly from the assembly; and

i. said lithium elements contacting corresponding surfaces of said internal flanges of said container elements in a manner sealing against flow of cathode material between said lithium elements and said flanges.

3,996,067

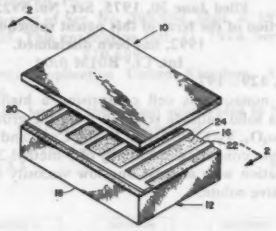
SILICON NITRIDE COATED, PLASTIC COVERED SOLAR CELL

Jacob D. Broder, Cleveland Heights, Ohio, assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1975, Ser. No. 645,508

Int. Cl.² H01L *31/06; C23C 15/00*

U.S. Cl. 136—89 **7 Claims**



1. A covered solar cell consisting essentially of

a wafer of semiconductor material having a junction diffused therein,

an electrical contact on the upper surface of said wafer,

a silicon nitride anti-reflection coating on said surface of said wafer, and

a transparent plastic cover of a fluorinated ethylene propylene copolymer bonded to said non-oxide anti-reflective coating.

3,996,068

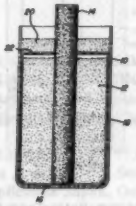
PRIMARY DRY CELL

Lewis F. Urry, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 391,611, Aug. 27, 1973, Pat. No. 3,888,699, which is a continuation of Ser. No. 59,272, July 29, 1970, abandoned. This application June 5, 1975, Ser. No. 583,920

Int. Cl.² H01M *6/06*

U.S. Cl. 429—101 **3 Claims**



1. A primary dry cell comprising a zinc anode, a cathode depolarizer mix cake containing manganese dioxide and a conductive material, and a separator interposed between said anode and said cathode depolarizer mix cake, said cathode depolarizer mix cake being wetted with an inner electrolyte comprising an aqueous solution containing a metallic salt selected from the group consisting of zinc bromide, magnesium chloride, magnesium perchlorate and magnesium bro-

mide, said inner electrolyte constituting from about 60 to 71 percent by volume of the total cathode depolarizer mix cake.

3,996,069

NONAQUEOUS CELL UTILIZING A 3ME2OX-BASED ELECTROLYTE

Marvin L. Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,026
The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.
Int. Cl.² H01M 6/04
U.S. Cl. 429—197 16 Claims

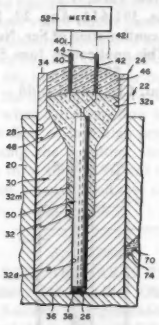
1. A nonaqueous cell comprising a highly active metal anode, a solid cathode selected from the group consisting of FeS_2, Co_3O_4, V_2O_5, Pb_3O_4, In_2S_3 and CoS_2, and a liquid organic electrolyte consisting essentially of 3-methyl-2-oxazolidone in combination with at least one low viscosity cosolvent and a conductive solute.

3,996,070

THERMOCOUPLE INSTALLATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Walter B. Powell, Altadena; Lee R. Potter, Pasadena, and Kenton S. MacDavid, Altadena, all of Calif.

Filed Nov. 22, 1974, Ser. No. 526,450
Int. Cl.² H01V 1/04
U.S. Cl. 136—233 7 Claims



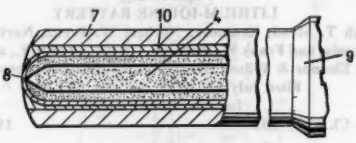
1. A thermocouple installation comprising:
a plate-like mass with a surface;
a pair of insulated wires extending through said mass and having exposed ends lying flush with said surface of said mass; and
a thin electrically and thermally conductive plating layer lying on said surface of said mass and on said exposed ends of said wires, said layer electrically interconnecting said wires and thermally connecting said wires to the adjacent portion of said mass.

3,996,071

TEMPERATURE MEASURING DEVICE FOR USE AT PRESSURES IN EXCESS OF 1,500 BAR

Bernhard Klicks, Hagen, Haspe; Gunter Dornhoff, Hagen; Josef Stalzer, Hagen, and Jorg-Peter Korner, Hagen, all of Germany, assignors to Friedrich Vade GmbH, Dortmund, Germany

Continuation of Ser. No. 472,948, May 24, 1974, abandoned.
This application Mar. 15, 1976, Ser. No. 666,677
Claims priority, application Germany, June 12, 1973, 2329836
Int. Cl.² C04B 31/06; H01V 1/04
U.S. Cl. 136—233 1 Claim



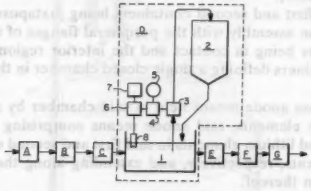
1. A temperature measuring device for use at pressures in excess of 1,500 bar. and for mounting in a shouldered bore leading from the outside into a high pressure equipment, said device comprising
1. a thermocouple adapted to be inserted in such bore,
2. a metallic sheath enclosing said thermocouple,
3. a metallic open-ended pressure bearing sleeve surrounding the entire length of said sheath and substantially filling such shouldered bore,
4. said pressure bearing sleeve being spaced from said metallic sheath,
5. a hard metal solder filling the space between and adhered to said pressure bearing sleeve and said sheath,
6. a cone-like surface welded to the outer end of said pressure bearing sleeve for engaging the shoulder of the bore, and
7. a screw threaded flange nut on the outer end of said thermocouple for tightening said cone-like surface against the shoulder of the bore.

3,996,072

PHOSPHATE COATING PROCESS AND CONTROL OF THE PHOSPHATE COATING SOLUTION

Shoji Oka, Nara; Ryoichi Murakami, Neyagawa, and Toshihiro Okai, Amagasaki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 21, 1975, Ser. No. 606,609
Claims priority, application Japan, Aug. 23, 1974, 49-97251
Int. Cl.² C23F 7/08
U.S. Cl. 148—6.15 R 16 Claims



1. A method of forming phosphate coatings on the surfaces of a metal object which comprises applying a phosphate coating solution containing a nitrite to the metal surfaces, said coating solution being contacted with an anion-exchanger loaded or contacted with nitrite ions, thereby permitting the substitution of the nitrite ions present in the anion-exchanger for the nitrate ions present in the coating solution during contact with the anion-exchanger in response to variations in the nitrite ion concentration of the coating solution.

3,996,073

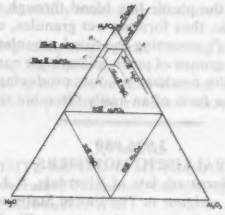
INSULATIVE COATING FOR ELECTRICAL STEELS

James D. Evans, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 513,951, Oct. 11, 1974, Pat. No. 3,948,786. This application Nov. 5, 1975, Ser. No. 629,060

Int. Cl.² C23F 7/10

U.S. Cl. 148—6.15 R 6 Claims



1. A process of providing an insulative coating directly on electrical steel and on electrical steel having a mill glass thereon comprising the steps of applying to said steel a coating solution containing an Al^{+++}, Mg^{++} and $H_2PO_4^-$ concentration in the following relative relationship on a water-free basis: from 3 to 11% weight Al^{+++} calculated as Al_2O_3, from 3 to 15% by weight Mg^{++} calculated as MgO and from 78 to 87% by weight $H_2PO_4^-$ calculated as H_3PO_4, the total weight percentage of Al^{+++} (as Al_2O_3), Mg^{++} (as MgO) and $H_2PO_4^-$ (as H_3PO_4) being 100 on a water-free basis, said concentration of Al^{+++}, Mg^{++} and $H_2PO_4^-$ comprising 100 parts by weight calculated as Al_2O_3, MgO and H_3PO_4 respectively on a water-free basis, and from 0 to 150 parts by weight of colloidal silica on a water-free basis, at least 45% by weight of said coating solution being water, and subjecting said coated steel to a heat treatment at a temperature of from about 700° to about 1600° F.

3,996,074

METHOD FOR IMPROVING HYDROLYTIC STABILITY OF THE BOND BETWEEN STEEL SURFACES AND ORGANIC ADHESIVES

Lawrence F. Rakestraw, Raleigh; Richard W. Bullard, Durham; John E. Niesse, Raleigh, and Malcolm F. Bender, Durham, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 28, 1975, Ser. No. 608,428

Int. Cl.² C23F 7/10

U.S. Cl. 148—6.16 14 Claims

1. A method for improving the hydrolytic stability of the adhesive bond between a steel or alloy steel reinforcing element for rubber articles and an RFL type organic adhesive, said method comprising the following steps in sequence:

a. cleaning the surface of the steel or steel alloy reinforcing element by immersion in a halogenated hydrocarbon solvent which has been heated to the boil and thereafter passing the element through condensed vapors of said solvent;

b. coating the cleaned steel or steel alloy surface with crystalline or microcrystalline zinc phosphate;

c. subjecting the zinc phosphate coated steel or steel alloy surface to a water rinse;

d. immersing the phosphated steel or steel alloy surface in an aqueous solution containing from about 0.1 to 0.25 percent by weight of chromic acid or a water-soluble chromate;

e. rinsing said surface with deionized water to remove excess chromate or chromic acid solution;

f. drying the surface of said steel or steel alloy reinforcing element;

g. dipping said element in an RFL type organic adhesive composition; and

h. curing said dipped element.

3,996,075

METHOD FOR MAKING A HEAT TREATED ALUMINUM ALLOY ARTICLE

Charles P. Furney, Jr., Delmont, and Richard Couchman, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 393,954, Sept. 4, 1973, Pat. No. 3,850,705. This application Oct. 31, 1974, Ser. No. 519,689

Claims priority, application United Kingdom, Aug. 14, 1974, 35830/74

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² C22F 1/04

U.S. Cl. 148—13.1 9 Claims

1. A method for making a heat treated aluminum alloy article of reduced warpage or reduced tendency to warp during a possible machining step, comprising the steps of bonding insulation onto selected areas of the article with a bonding means for maintaining a bond during heating for solution heat treatment, solution heat treatment, solution heat treating the thus-insulated article, and, with the insulation still on the article, subjecting the solution heat treated article to a quench for maintaining precipitable components of the alloy in solution, and, subsequent to the quench, age-hardening the article.

3,996,076

PROCESS FOR QUENCH HARDENING WITH POLYACRYLATE QUENCHING MEDIUM

Takashi Tokuue, Yokohama, and Takashi Kato, Yokosuka, both of Japan, assignors to Toho Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 402,781, Oct. 2, 1973, Pat. No. 3,939,016. This application June 4, 1975, Ser. No. 583,538

Claims priority, application Japan, Oct. 2, 1972, 47-97969

Int. Cl.² C21D 1/48; B23K 35/24

U.S. Cl. 148—18 6 Claims

1. A process for quench hardening metal comprising heating the metal to a quench hardening temperature and thereafter immersing said metal in a quenching medium consisting essentially of an aqueous solution containing 0.4 to 10% by weight of at least one polymer selected from polyacrylic acid, polymethacrylic acid, a copolymer of methacrylic acid and acrylic acid, and salts thereof, said polymer having an intrinsic viscosity $[\eta]$ of 0.010 to 0.050 l/g/.

3,996,077
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING AN INSULATION LAYER SUNK IN A SEMICONDUCTOR BODY AND SEMICONDUCTOR DEVICE MANUFACTURED ACCORDING TO SAID METHOD

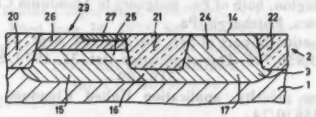
Wilhelmus Henricus Cornelis Gerardus Verkuijlen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 552,976

Claims priority, application Netherlands, Mar. 15, 1974, 7403470

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **18 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

a. providing a semiconductor body comprising a first surface and an underlying semiconductor portion that is of first conductivity type;

b. providing a doping material of said first conductivity type at a first portion of said first surface prior to the formation of a sunken isolation layer, said first portion being situated beside said sunken isolation layer;

c. forming the isolation layer consisting of insulating material and sunk locally in said body from said first surface; and

d. introducing said doping material into said semiconductor body via said first portion of said first surface so as to form a zone of said first conductivity type, said zone contacting said underlying semiconductor portion and extending at the area of contact to a depth greater than that of said sunken isolation layer.

3,996,078
EXPLOSIVE COMPOSITION AND EUTECTIC MIXTURE THEREFOR

Maximilian Klunsch, Opladen; Paul Lingens, Leverkusen, and Heinz Ratz, Bonn-Ippendorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 413,720, Nov. 7, 1973, Pat. No. 3,926,696, which is a continuation of Ser. No. 259,353, May 26, 1972, abandoned. This application Apr. 24, 1975, Ser. No. 571,182

Claims priority, application Germany, May 29, 1971, 2126921; May 29, 1971, 2126922

Int. Cl.² C06B *45/00*; **C09K** *50/00*

U.S. Cl. 149—2 **19 Claims**

1. A flowable eutectic composition for use in an explosive which consists essentially of an oxygen supplying salt, a combustible compound and at least 30% by weight of a nitrate or perchlorate of an alkanolamine, said eutectic composition having a solidification point of below −10° C., said composition free of uncombined water.

3,996,079
METAL OXIDE/AZIDE GAS GENERATING COMPOSITIONS

Mario Angelo DiValentin, Otterburn Park, Canada, assignor to Canadian Industries, Ltd., Montreal, Canada

Filed Dec. 3, 1974, Ser. No. 529,035

Claims priority, application United Kingdom, Dec. 17, 1973, 582691/73

Int. Cl.² C06B *35/00, 33/00*

U.S. Cl. 149—35 **5 Claims**

1. A process for the preparation of a gas generating composition adapted on burning to form nitrogen gas and a solid residue in the form of a sintered mass, comprising the steps of - a) preparing a mixture consisting essentially of dry particles of nickel oxide or iron oxide and dry particles of alkali metal azide or alkaline earth metal azide in molar proportions adequate on burning to oxidize all the azide to nitrogen and form alkali metal oxide or alkaline earth metal oxide, b) adding sufficient fluid to the dry mixture to dissolve at least some of the azide and provide a mixture of granulating consistency, c) mixing the fluid-containing mixture to form a plastic-like blend, d) forcing the plastic-like blend through a perforated plate, screen or die, thus forming wet granules, e) drying the wet granules, and f) screening the dried granules to separate and retain for use groups of particles having a narrow particle size distribution, the resultant product producing upon burning a residue in the form of an easily filterable sintered mass.

3,996,080
BALLISTIC MODIFIERS

Joseph S. Stack, deceased, late of Riverdale, N.J. (by Marian C. Stack, heir), assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1971, Ser. No. 210,266

Int. Cl. C06b *25/34*

U.S. Cl. 149—92 **10 Claims**

1. A high energy double base propellant composition comprising a nitramine crystalline filler and, as a ballistic modifier, a mixture of lead and tin oxides.

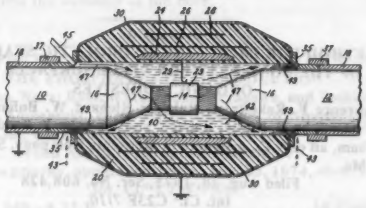
3,996,081
METHOD FOR MAKING A HIGH VOLTAGE CABLE SPLICE

Roy Nakata, Pittsfield, Mass., assignor to General Electric Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 509,504, Sept. 29, 1974, Pat. No. 3,951,712. This application Feb. 10, 1976, Ser. No. 657,005

Int. Cl.² H01B *13/00*

U.S. Cl. 156—48 **11 Claims**



1. A method of making a splice between two sections of high voltage cable, each comprising: a conductor section and original electrical insulation surrounding said conductor section, the conductor section having an exposed end extending beyond the end of said original insulator, said method comprising:

a. electrically and mechanically joining the exposed ends of said conductor sections to form a conductor,

b. providing about said conductor and the ends of said original insulation a sleeve primarily of insulating material spaced from and surrounding the conductor and said ends, said sleeve including voltage grading means comprising a tubular conductive shield adjacent the inner periphery of the sleeve,

c. providing conductive means extending between said shield and said conductor for electrically connecting said shield to said conductor,

d. providing at one end of said sleeve in a location between said original insulation and said sleeve a ring of porous material,

e. pumping into the space between said sleeve and the cable portion surrounded by said sleeve a slurry comprising a liquid and particles suspended in said liquid having good electrical insulating properties,

f. allowing the liquid component of said slurry to discharge from said space via the pores in said ring but filtering out said particles within said space so as to build up from the internal surface of said ring a deposit of said particles,

g. blocking discharge of the components of said slurry from said space sufficiently to develop within said space pressures substantially exceeding those downstream from said ring,

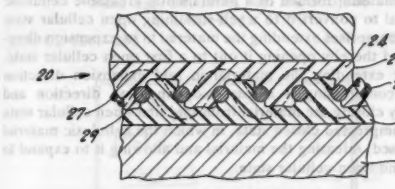
h. continuing said pumping and filtering action and thereby continuing the build-up of said deposit until the deposit spans said space between the internal wall of said sleeve and the cable portion surrounded thereby.

3,996,082

COMPOSITE BONDING METHOD AND MEANS

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Filed Aug. 14, 1975, Ser. No. 604,832
Int. Cl.² B29C 27/04
U.S. Cl. 156—73.5 7 Claims



1. A process for joining first and second thermally bondable bodies exhibiting at least some mutual fusion bonding incompatibility by means of a composite bonding agent including first and second thermoplastic material layers joined at least in part by mechanical engagement with a medial fibrous stratum, said first and second thermoplastic material layers having fusion bonding compatibility with said first and second bodies, respectively, and bonding compatibility with each other, said method comprising the steps of:

juxtapositioning the first and second bodies so that the portions thereof to be bonded are contiguous;

inserting the bonding agent between the bodies with the thermoplastic material layers adjacent the bodies with which they have bonding compatibility;

heating at least one of the composite bonding agent and adjacent portion of the bodies to a thermally fusible state by generating a temperature increase initially only at the exterior surface of at least one of the agent and portions; and

bringing said first and second bodies into abutment with said composite bonding agent to form fusion bonds with said first and second material layers, respectively.

3,996,083

PROCESS FOR MAKING DRAPERIES

Ronald Wade Morgan, 9509 Tiverton Way, Louisville, Ky. 40222, and David L. Witherspoon, P.O. Box 23182, 2104 Evergreen Road, Anchorage, Ky. 40223

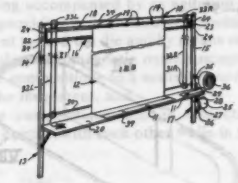
Continuation-in-part of Ser. No. 505,619, Sept. 13, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,166
Int. Cl.² B32B 7/08
U.S. Cl. 156—92 6 Claims

1. In a process for making draperies, wherein one or more widths of material are sewed to form a panel, the improvement of making a reinforced heading for said panel, which comprises:

A. suspending a panel of drapery material vertically from the hem end, with the back surface of said panel facing forwardly,

B. placing the first face of a strip of reinforcing material, having first and second faces, on said back surface of said panel along the bottom free edge of said panel;

C. adhesively securing said first face of said strip of reinforcing material to the back surface of said panel;



D. folding said panel of material with said strip of reinforcing material adhesively secured thereto over itself so that the strip of reinforcing material is sandwiched between two layers of said panel, the other face of said strip lying in contact with the adjacent portion of the back surface of said panel;

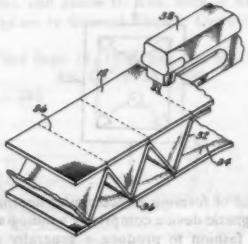
I. securing said strip of reinforcing material and said two layers of said panel together to form a reinforcing heading for said drapery panel.

3,996,084

LOCK CORE PANEL

Richard N. Holmes, Laguna Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 479,842, June 17, 1974, Pat. No. 3,960,236. This application May 21, 1975, Ser. No. 579,378
Int. Cl.² B32B 7/08
U.S. Cl. 156—93 5 Claims



1. The method of making a lock core panel of layers of strands forming a face sheet, a base sheet spaced from said face sheet and impervious to sound waves, and a core sheet, said sheets being fibrous, said fibrous sheets preimpregnated with a resin, comprising the steps of alternately stitching the core sheet to the face and to the base sheet, forming the resulting composite to its resultant shape and curing to create a rigid structural panel.

3,996,085

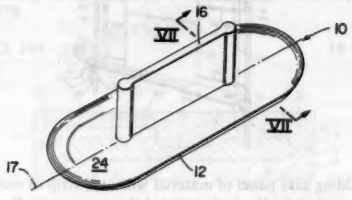
TUBE-TIRE PATCH AND METHOD AND APPARATUS FOR APPLYING SAME

Dwaine R. Barnes, Gladstone, Oreg.; Marvin E. Beyers, Peoria; Donald G. Boundy, East Peoria, both of Ill.; Robert W. Untz, Hanna City, and Robert M. Wilcox, Minonk, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 5, 1975, Ser. No. 574,820

Int. Cl.² B29H 5/16

U.S. Cl. 156—97 12 Claims



1. A tube-tire patch, comprising:

an internally reinforced cured rubber member having a generally smooth concave surface and having internally thereof a plurality of fabric layers generally parallel to said concave surface;

a stem integral with said member and upraised generally centrally from said concave surface;

an uncured rubber layer covering said concave surface; and

a removable protective cover generally at least coextensive with said concave surface and covering said uncured rubber layer.

3,996,086

FORMING METHOD

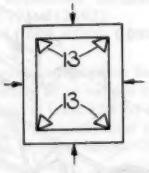
Brian Stanley Worrall, Sutton Coldfield, England, assignor to Expert Industrial Controls Limited, Ashby-De-La-Zouch, England

Filed Aug. 12, 1975, Ser. No. 603,995

Claims priority, application United Kingdom, Aug. 22, 1974, 36892/74

Int. Cl.² B65H 81/00

U.S. Cl. 156—194 11 Claims



1. A method of forming a rectangular laminated frame for an electromagnetic device comprising winding a strip of material in spiral fashion to produce a generally annular frame blank, and subjecting said blank to a forming process which includes the step of applying pressure in an outward direction at four spaced points on the internal peripheral surface of the blank, thereby to deform the blank to the required shape, the pressure being applied at the four spaced points by outwardly movable shoes, the shoes being initially positioned and the paths of movement being such that no relative slipping of the shoes and the internal peripheral surface of the blank occurs during the outward movement of the shoes.

3,996,087

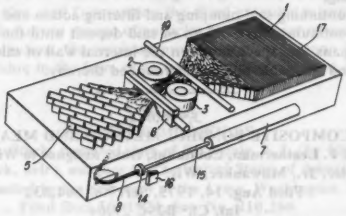
HONEYCOMB MATERIALS

George May, deceased, late of Chawston, England; by Gloria Elizabeth May, executrix; by Heather Miranda Adlam, executrix, both of London, England, and Desmond Deverell White, Rhyl, England, assignors to Dufaylite Developments Limited, Great Britain

Filed Mar. 4, 1975, Ser. No. 555,321

Int. Cl.² B31D 3/02

U.S. Cl. 156—197 7 Claims



1. A method of treating an unexpanded structural honeycomb material formed of a permanently creasable cellulosic material to convert it to a self-sustaining open cellular state which comprises extending the material in its expansion direction and thereby opening it out to a first open cellular state, further extending the material in said expansion direction while compressing it across said expansion direction and thereby closing the material from said first open cellular state to a compressed closed state, in which the cellulosic material is creased; releasing the material and allowing it to expand to a second open cellular state.

3,996,088

METHOD OF ASSEMBLING AND EMBOSSING MULTIPLE LAYER WORKPIECES

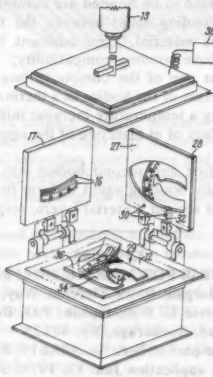
Ivan P. Crouch, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed Aug. 28, 1972, Ser. No. 284,040

Claims priority, application United Kingdom, Aug. 28, 1971, 40454/71

Int. Cl.² B32B 31/18, 31/20, 31/22

U.S. Cl. 156—211 2 Claims



1. A method of embossing a multiple layer workpiece comprising the steps of:

engaging a blank with a first die to mark the blank along the periphery of an area portion defined by die surfaces of the first die;

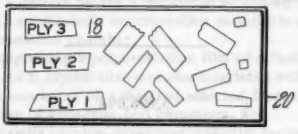
locating a means for operating on the blank relative to the imposed mark;
activating the operating means to make the blank into a model of the workpiece;
making a second die conformably to the model;
assembling layers of the workpiece in overlapping relation to each other;
welding together the layers of the workpiece only along the periphery of the area portion defined by the die surfaces of the first die with the first die;
removing portions of one layer of the workpiece outside the welded periphery of the area portion;
registering the second die with the workpiece relative to the retained area portion of the workpiece; and lastly applying heat and pressure to the second die for simultaneously embossing the workpiece and welding together the layers of the workpiece over the entire area portion of the workpiece defined by the second layer.

3,996,089

METHOD FOR THE HANDLING OF PRE-IMPREGNATED COMPOSITE TAPES

Edwin R. More, Simsbury, Conn., and Harry A. Nutter, Jr., Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1975, Ser. No. 573,040
Int. Cl.² B32B *31/00*
U.S. Cl. 156—235 **10 Claims**



1. A method for the formation of a multilayer article, the article comprising a plurality of plies of a composite including reinforcing filaments captured in uncured resinous matrix material, said method comprising the steps of:
sandwiching a composite tape between a pair of liners, the adhesive attraction between the upper liner and the resinous matrix material being less than the adhesive attraction between the lower liner and the resinous matrix material;
positioning the composite tape and liners on a cutting table;
cutting the upper liner and composite tape to define a plurality of plies of the multilayer article being formed;
removing the severed portions of the upper liner from the plies defined during cutting; and
serially removing and stacking the composite tape plies defined during cutting from the lower liner, the plies of tape being stacked simultaneously with removal from the lower liner, the adhesive attraction between contacting surfaces of adjacent plies of tape being greater than the adhesive attraction of the tape to the lower liner and being employed to achieve removal and stacking.

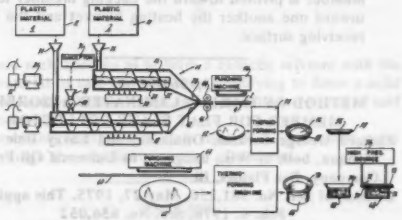
3,996,090

METHOD OF MAKING CONTAINER ARTICLE HAVING HEATABLE STRATIFIED MATERIAL PORTION

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Division of Ser. No. 215,855, Jan. 6, 1972, Pat. No. 3,802,985.
This application Mar. 7, 1974, Ser. No. 448,985
Int. Cl.² B29C *27/04;* **B29F** *3/02*
U.S. Cl. 156—244 **12 Claims**

1. A method of making a closed container article having a plurality of parts joined along closure seams comprising the steps of:
providing a first article part having a container article element region and a first thermally joinable region;
providing a second article part by coextrusion through layer forming dies by,
providing a plurality of fusible thermoplastic compositions at first locations removed from the layer forming dies,
moving the compositions from the first location towards the dies, the movement of at least one of the compositions being accompanied by an agitation thereof,
uniformly providing in one of the compositions during its movement toward the die and by means of its agitation, a particulate ferromagnetic oxide susceptor;
heating the compositions to a malleable and fusible state during the movement, and
forcing the compositions through respective dies into intimate contact with each other while in the malleable



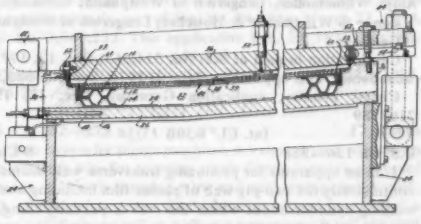
and fusible state to form a sheet having joined stratified layers of the compositions coextensive with its dimensions,
forming the stratified sheet into a second container article part having a container article element region and a second thermally joinable region contiguous with the article element region, each of said regions containing the susceptor laden layer;
juxtapositioning the first and second article parts so that the thermally joinable regions of said first and second article parts are contiguous along a closure seam;
applying an alternating magnetic field to the thermally joinable region of said second article part to heat the regions; and
bringing the contiguous regions of the first and second article parts into contact to effect thermal joinder between the two to seal the part into the container article.

3,996,091

METHOD AND APPARATUS FOR HEAT BONDING

John E. Daunt, and James D. Kise, both of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 11, 1974, Ser. No. 504,902
Int. Cl.² B32B *35/00*
U.S. Cl. 156—285 **2 Claims**



1. Apparatus for making a substantially rigid heat bonded article from a plurality of cooperating members comprising:

a rigid backing member including a workpiece cavity therein having a rigid article receiving surface;

a rigid top member adapted for pivotal movement with respect to the backing member;

a flexible heating blanket comprising a flexible, resilient rubber-like material having embedded therein an electric resistance heater, the blanket being preshaped to reflect contour of the article to be made, being positioned in spaced apart relationship with the article receiving surface, and being adapted to contact and to provide heat to at least one of the cooperating members of the article; and

fluid pressure means comprising a resilient sponge member having a plurality of discrete cells closed one from another to retain in each compartment a compressible fluid, the fluid pressure means being carried by the top member and including a pressure transmitting surface for location in juxtaposition with the workpiece cavity when the top member is pivoted toward the backing member to press toward one another the heating blanket and the article receiving surface.

3,996,092

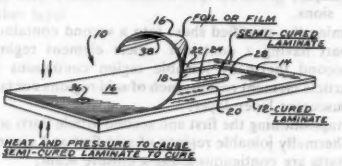
METHOD OF MAKING LAMINATED ABSORBER MEMBER FOR FLAT PLATE COLLECTOR

Richard George Sarazin, Onalaska, and Larry Dale Olson, Viroqua, both of Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 581,250, May 27, 1975. This application Feb. 6, 1976, Ser. No. 656,052

Int. Cl.² C09J 5/00, 7/00

U.S. Cl. 156—309 **2 Claims**



1. A method of forming an internally channeled absorber member for a flat plate solar collector comprising the steps of: overlaying a self-supporting, flat base sheet of fully cured glass epoxy laminate with a pre-cut, patterned layer of semi-cured glass epoxy; overlaying the patterned layer with a thin heat absorbing sheet; placing the composite so formed in a press; and squeezing said composite in the presence of heat until said semi-cured epoxy has cured and has bonded to the underlying base sheet and the overlying heat absorbing sheet.

3,996,093

APPARATUS FOR PRODUCING TRANSVERSE WELD SEAMS IN A TWO-PLY WEB OF PLASTIC FILM

Aloys Winnemoller, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Continuation-in-part of Ser. No. 314,363, Dec. 12, 1972, abandoned. This application June 4, 1975, Ser. No. 583,541

Claims priority, application Germany, Dec. 17, 1971, 2162789

Int. Cl.² B30B 15/34

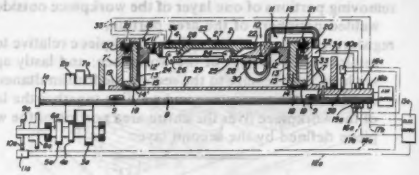
U.S. Cl. 156—358 **8 Claims**

1. In an apparatus for producing transverse weld seams in a continuously fed two-ply web of plastic film including a rotary welding cylinder about which the web is partially slung, the improvement which comprises:

a plurality of welding bars movably mounted from a fully retracted to a fully extended position on said cylinder and defining the outer periphery of said cylinder,

a means associated with said welding bars for adjusting said welding bars along respective radius of said cylinder from said fully retracted to said fully extended positions whereby in said fully extended position the radius of the welding cylinder is increased

adjustable supporting members mounted on said cylinder between said welding bars for supporting said web, said supporting members including means for adjusting said supporting members along the radius of said cylinder and



serving to partially guide said web around a processing path;

means for sequentially energizing said welding bars in a sequence which is independent of the number of said welding bars; and

said welding bars being spaced apart a distance whereby the spacing between adjacent welding bars when in the fully retracted position is equal to half the smallest desired spacing between adjacent transverse weld seams.

3,996,094

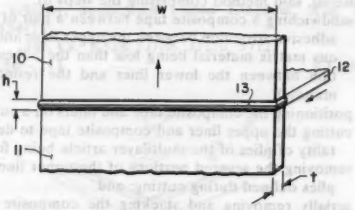
SILICON MANUFACTURE

I. Arnold Lesk, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 2, 1975, Ser. No. 537,981

Int. Cl.² B01J 17/18, 17/08

U.S. Cl. 156—608 **3 Claims**



1. A method of producing monocrystalline semiconductor material in web form which comprises the steps of:

providing a web of polycrystalline semiconductor material having a width which is much greater than its thickness, said web corresponding substantially in shape to that desired for the monocrystalline material;

providing a monocrystalline semiconductor material seed having relatively the same dimensions as the polycrystalline source;

providing a semiconductor material shaping member, said shaping member and said web being made of the same semiconductor material;

contacting the source, the seed and shaping member;

heating the interface therebetween preferentially to produce a molten zone having a thickness no greater than that of said web; and

moving said monocrystalline semiconductor material seed away from said molten zone as monocrystalline semiconductor material is formed thereon.

3,996,095

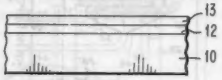
EPITAXIAL PROCESS OF FORMING FERRITE, Fe_3O_4 AND γFe_2O_3 THIN FILMS ON SPECIAL MATERIALS

Kie Yeung Ahn, Chappaqua; Christopher Henry Bajorek, Goldens Bridge; Robert Rosenberg, Peekskill, and King-Ning Tu, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,540

Int. Cl.² B01J 17/30; B05D 5/12; C23C 15/00

U.S. Cl. 156—610 14 Claims



1. A method of depositing magnetic ferrite films on a substrate comprising the sequential steps of:

placing a substrate having a surface to be coated in an evacuable deposition chamber,

vacuum depositing on said substrate a polycrystalline film of a first material having a crystal structure with lattice constants on the order of 8.35A by 8.35A square and

then epitaxially vacuum depositing on said polycrystalline film a magnetic ferrite film having a cubic spinel structure, said polycrystalline film providing characteristics favorable to epitaxial ferrite deposition.

6. A method of depositing magnetic ferrite films on a substrate comprising the sequential steps of:

placing a substrate having a surface to be coated and comprising a substantially noncrystalline material in an evacuable deposition chamber,

vacuum depositing a polycrystalline film of a first material having b.c.c. crystal structure characteristics with a (110) texture consisting of a material selected from the group consisting of vanadium and chromium, and

then epitaxially vacuum depositing magnetic ferrite on said polycrystalline film.

12. A magnetic thin film ferrite epitaxially deposited upon a substrate coated with an intermediate thin film layer of a metal having a crystal structure with lattice constants yielding crystal structures on the order of about 8.35A × 8.35A square, said metal having been deposited by a method selected from the group consisting of evaporation at a pressure on the order of 10^{-6} Torr and sputtering in an inert atmosphere at a pressure on the order of 2×10^{-2} Torr, and

then epitaxially vacuum depositing said ferrite on said intermediate layer to form a cubic spinel structure upon said intermediate layer.

3,996,096

METHOD FOR CRUCIBLE-FREE ZONE MELTING OF SEMICONDUCTOR CRYSTAL RODS

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468. This application Dec. 8, 1975, Ser. No. 638,261

Claims priority, application Germany, Nov. 22, 1973, 2358300

Int. Cl.² B01J 17/10

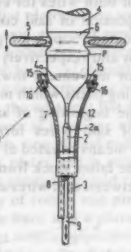
U.S. Cl. 156—620 2 Claims

1. A method of crucible-free zone melt processing of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a crucible-free zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point thereon;

uniformly supporting said lower end of said rod by axially upwardly moving a hollow funnel-shaped casing from a position below said juncture between the seed crystal and the rod to a position surrounding the lower end of said rod, said casing having relatively low melting pure metal inserts attached at the upper periphery of said funnel-shaped casing, said inserts melting upon contact with the still-hot lower end of the rod as such rod is traversed by



said melt zone so as to form a eutectic mixture with the material of said rod and then solidifying to form a solid connection between said casing and the lower end of said rod; and

controllably moving said melt zone from said select point through the remaining portion of said rod.

3,996,097

KRAFT MILL RECOVERY SYSTEM

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,092

Int. Cl.² D21C 11/04, 11/12

U.S. Cl. 162—30 K 2 Claims

1. In the process for the pulping of lignocellulosic material with pulping liquor, evaporation of the pulping liquor, combustion of the pulping liquor and precipitation as precipitator catch of the solids that are mixed with the combustion gases, said precipitator catch containing sodium sulfate, sodium chloride, sodium carbonate and organic material,

the process which comprises continuously adding water to the precipitator catch to produce a flowable slurry thereof,

adding carbon dioxide to said slurry in an amount sufficient to convert said sodium carbonate to sodium bicarbonate,

filtering said slurry to produce a solid of sodium sulfate and sodium bicarbonate and a liquid containing sodium chloride, and

separating said solid and liquid.

3,996,098

TWIN-WIRE PAPER MACHINE WITH COMMON WIRE PATH CONTROLS

Matti Kankaanpaa, Espoo, Finland, assignor to Valmet Oy, Finland

Continuation-in-part of Ser. No. 493,704, July 31, 1974, which is a continuation-in-part of Ser. No. 344,260, March 23, 1973, Pat. No. 3,846,232. This application Dec. 29, 1975, Ser. No. 644,445

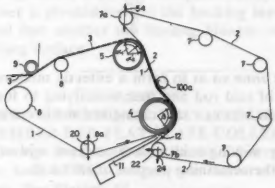
Claims priority, application Finland, June 13, 1975, 1774/75

Int. Cl.² D21F 1/00, 1/40, 1/50

U.S. Cl. 162—273 17 Claims

1. In a twin-wire paper machine, a web-carrying wire and a web-pressing wire for pressing a web during formation thereof between said web-carrying wire and said web-pressing wire, both of said wires respectively forming closed loops, and a rotary web-forming roll as well as a rotary couch roll situated in the closed loop of said web-carrying wire with said couch roll being situated at an elevation higher than said forming roll and said wires both traveling along a common path upwardly

from said forming roll to said couch roll while said pressing wire presses a web traveling along said common path between said carrying wire and pressing wire with said carrying wire continuing the transport of the web beyond said pressing wire where said web-carrying wire travels beyond said couch roll, said web-forming roll having a suction sector situated along said common path of both wires for enhancing dewatering of a web at an initial portion of said common path where said suction sector is located, a pair of guide rolls respectively situated in said loops and respectively engaging said wires for guiding the latter for movement toward each other respectively along converging paths which meet at said web-forming roll to determine the beginning of said common path, said converging paths of said wires forming a stock-receiving throat, and headbox means situated at the region of said throat for delivering into the latter stock from which a web is formed as the web travels between said wires along said common path,



and rotary deflecting-roll means situated in the loop of said pressing wire along said common path between said forming and couch rolls and rotating only in response to travel of said pressing wire from said forming roll toward said couch roll, said forming and couch rolls defining between themselves a space situated on one side of a line tangent to said forming and couch rolls and contacting said common path at the region of said forming roll and at the region of said couch roll, said deflecting roll means being situated at least in part in said space and deflecting both of said wires into said space at said one side of said tangent line for increasing the extent to which said wires lap said forming and couch rolls, said wires as they travel along said common path from said forming roll to said couch roll, if they engage any components, engaging only freely rotatable structure such as said deflecting roll so that said wires do not frictionally rub against any components such as stationary components or the like as said wires travel along said common path.

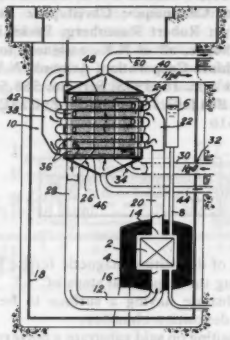
3,996,099

LOW TEMPERATURE STEAM GENERATOR

Pierre Faugeras, Versailles; Alfred Lecocq, Bures-sur-Yvette, and Jean-Louis Romet, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 30, 1975, Ser. No. 645,371
Claims priority, application France, Jan. 3, 1975, 75.00129
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—49 **9 Claims**

1. A steam generator comprising within a common enclosure a molten-salt nuclear reactor having a reactor core, a fluidized-bed heat exchanger located above the reactor core in said common enclosure, a molten-salt circuit, said reactor core and said heat exchanger being components of said molten-salt circuit, said heat exchanger comprising a vessel having a first bank of primary tubes and a second bank of secondary tubes which are spaced from said primary tubes, said secondary tubes comprising part of a secondary coolant circuit, said molten salt being circulated within the primary tube elements of said heat exchanger whilst water is circulated within the secondary tube elements and is discharged in the form of steam, the two banks of tube elements being immersed in a particle bed means for subjecting said particle bed to agitation by a stream of inert gas wherein heat is transferred from the



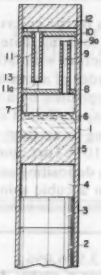
molten-salt in said primary tubes to the water in said secondary tubes by means of the particles in said bed.

3,996,100

VENTED NUCLEAR FUEL ELEMENT

Masaomi Oguma; Akira Maru, both of Hitachi; Eiichi Sagi, Iwaki, and Seiji Kawahara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,683
Claims priority, application Japan, Feb. 21, 1973, 48-20211
Int. Cl.[2] C09K *7/00*
U.S. Cl. 176—68 **5 Claims**



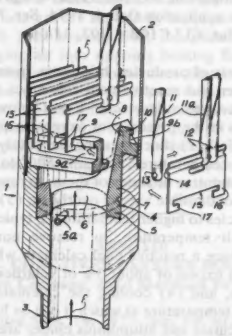
1. A vented nuclear fuel element venting gaseous fission products released from nuclear fuel disposed therein into the surrounding coolant, which comprises a vertical tubular container for containing the nuclear fuel therein, check valve means disposed over the top of the nuclear fuel for outwardly passing the gaseous fission products and for preventing the gaseous fission products from flowing back into the interior of the fuel element, said check valve means including a material in the liquid state at least under operating temperatures and a porous member not wet with the liquid state material for supporting the liquid state material, means for defining a chamber over the check valve means, and plug means disposed over the chamber, said plug means including a porous material that is wet with the surrounding coolant and prevents the gaseous fission products from passing through the porous material under a predetermined substantial pressure of the gaseous fission products and permits passage of the gaseous fission products through the porous material above the predetermined pressure for hold-up of the gaseous fission products in said chamber.

3,996,101

DEVICE FOR SUPPORTING A FUEL PIN CLUSTER WITHIN A NUCLEAR REACTOR FUEL ASSEMBLY WRAPPER

Pierre Marmonier; Bernard Mesnage; Jean Teulon; Jean Vayra, all of Aix-En-Provence, and Henri Venobre, Vinon-sur-Verdon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 11, 1975, Ser. No. 557,312
Claims priority, application France, Mar. 28, 1974, 74.10905
Int. Cl.² G21C 3/30
U.S. Cl. 176—78 10 Claims



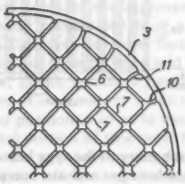
1. A device for supporting a cluster of fuel pins having end caps within the wrapper of a nuclear reactor fuel assembly comprising a coaxial supporting member at the lower end of the vertically-disposed fuel assembly wrapper, a plurality of parallel rails, grooves formed in the lower end-caps of a row of pins of the fuel cluster slidably engaged on the upper extremities of said rails, a lateral groove in and opening towards the periphery of said supporting member, fastening lugs forming lateral extensions of said rails, a re-entrant portion for each of said lugs mounted in said groove, said two fastening lugs for each of said rails being disposed in the plane of said rails, said re-entrant portions of said lugs for each of said rails engaging in two regions of said groove located on each side of a plane of symmetry at right angles to the plane of said rail and passing through the axis of the fuel assembly wrapper, locking means fixing the spacing between said parallel rails and extending into said groove within a space separating adjacent ones of said re-entrant portions of two adjacent rails.

3,996,102

SUPPORT GRID

Paul Thome, Saint-Cloud, France, assignor to Babcock-Atlantique Societe Anonyme, Paris, France

Filed May 30, 1972, Ser. No. 257,902
Int. Cl. G21c 3/34
U.S. Cl. 176—87 1 Claim



1. A support grid for a nuclear reactor fuel element assembly, characterized by a lattice of intersecting, beams, wherein each intersection of the lattice is a lattice node and each direction along a beam is a lattice directrix, comprising; a plurality of profile bars, said bars being disposed at each of said lattice nodes; a plurality of flat plates each having at least two opposing borders; each of said flat plates being disposed along a lattice directrix in the intervals between adjacent pairs of said profile bars; said flat plates being welded along two of said opposing borders to said adjacent profile bars; a peripheral support hoop having a plurality of metal beads formed on the inner surface of said hoop, a plurality of intermediate pieces each individual to a respective one of said flat plates to join each of said beads to the adjacent flat plates through said intermediate pieces; wherein at least one of said intermediate pieces has at least two ends, one of said ends being connected to the end of one of said plates and is connected out of the plane of said flat plate at another of said two ends to one of said beads and a plurality of rods a rod protruding from one end of each of said profile bars, and a plurality of elementary plates each in engagement with a respective one of said rods, said plates having peripheral notches formed therein for fluid.

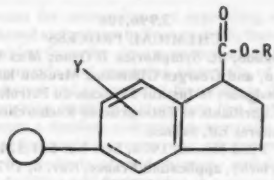
3,996,103

PROCESS FOR INHIBITING PLATELET AGGREGATION

Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 370,033, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,698, July 31, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,255
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² C12B 3/00
U.S. Cl. 195—1.8 3 Claims

1. A process for inhibiting platelet aggregation in vitro comprising the addition of a compound of the formula:



wherein ◯ is phenyl; Y is hydrogen, halogen, $-CF_3$, $-OH$, lower alkyl of 1 to 8 carbon atoms, lower alkoxy of 1 to 8 carbon atoms, $-NH_2$, $-SH$, or -S-lower alkyl of 1 to 8 carbon atoms; and R is hydrogen, or a pharmacologically acceptable cation, to whole blood or platelet-rich concentrates wherein the amount of the compound added is from about 0.01 to 50 micrograms per milliliter.

3,996,104

PROCESS FOR PREPARING FROM A MICROBIAL CELL MASS A PROTEIN CONCENTRATE HAVING A LOW NUCLEIC ACID CONTENT, AND THE PROTEIN CONCENTRATE THUS OBTAINED

Marianne Gunilla Lindblom, Bromma, and Håkan Lars Mogren, Solna, both of Sweden, assignors to SCP-exploatering AB, Solna, Sweden

Filed Jan. 21, 1975, Ser. No. 542,824
Claims priority, application Sweden, Feb. 7, 1974, 7401668
Int. Cl.² A23J 1/18
U.S. Cl. 195—5 25 Claims

1. A process for preparing from a microbial cell mass a protein concentrate having a low nucleic acid content, consisting essentially of forming a suspension of the cell mass,

subjecting the suspended cell mass to a mechanical disintegration treatment at a temperature less than 70° C to activate the endogeneous enzyme, incubating the suspension in the presence of a salt which is acceptable for human consumption, the incubation being performed at a temperature within the range of 30°–70° C and a pH within the range of 5–9, and separating the protein concentrate.

3,996,105

MIXED METHANE-UTILIZING CULTURES FOR PRODUCTION OF MICRO-ORGANISMS

David E. F. Harrison, Faversham; John H. Harwood, and Barry N. Herbert, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 6, 1975, Ser. No. 539,202

Claims priority, application United Kingdom, Jan. 7, 1974, 678/74

Int. Cl.² C12B *1/00*

U.S. Cl. 195—28 R **4 Claims**

1. A process for the production of micro-organisms in which a methane-utilising micro-organism which is a strain of Methylomonas having the NCIB Accession No. 11084 is grown under aerobic conditions in a liquid growth medium comprising assimilable sources of nitrogen and essential mineral salts, in the presence of methane gas and in the presence of (a) a methanol-utilising micro-organism having the NCIB Accession No. 11112 which is capable of metabolizing methanol produced by the strain of Methylomonas, and (b) one or more non-methylotrophic micro-organisms selected from the group of species comprising Pseudomonas having the NCIB Accession No. 11062, Mycobacterium having the NCIB Accession No. 11061, Pseudomonas having the NCIB Accession No. 11063 and Pseudomonas having the NCIB Accession No. 11065 which is/are capable of metabolising organic substances produced during the metabolism of methane and/or methanol.

3,996,106

CHEMICAL PROCESS

Paul Maldonado, St. Symphorien D'Ozon; Max Charpentier, Montesson, and Georges Glikmans, Meudon la Foret, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, France

Filed Nov. 6, 1974, Ser. No. 521,521

Claims priority, application France, Nov. 6, 1973, 73.39396

Int. Cl.² C12D *1/04*

U.S. Cl. 195—30 **9 Claims**

1. A process for the production of at least one of citric and isocitric acids, which comprises cultivating a citric and isocitric acid-producing strain of a yeast in a culture medium therefor, the medium containing a compound selected from the group consisting of cyano-acetic acid, inorganic salts and organic esters thereof and the amide thereof, in an amount sufficient to increase the production of said citric acid isocitric acids by the yeast, accumulating at least one of said citric and isocitric acid in the culture medium and recovering said citric and isocitric acid therefrom.

3,996,107

ENZYMATIC PRODUCTION OF A STARCH CONVERSION PRODUCT HAVING A HIGH MALTOSE CONTENT

Kaj Bennedick Martensson, Lund, Sweden, assignor to AB Stadex, Malmo, Sweden

Filed Aug. 28, 1974, Ser. No. 501,397

Claims priority, application Sweden, Aug. 28, 1973, 7311642

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 R **10 Claims**

1. A method of enzymatic manufacturing of a starch conversion product having a high maltose content, using as a starting material a solution of a substrate comprising starch or a partial hydrolysate thereof comprising bringing the substrate solution into contact with a matrix consisting of a copolymer of acrylamide and acrylic acid to which both an α-1.6-glucosidase and an α-1,4-glucosidase having β-amylase activity have been covalently coupled by a carbodiimide.

3,996,108

BRIQUETTING OF REACTIVE COAL CALCINATE WITH HIGH-TEMPERATURE COKE OVEN PITCH

Robert T. Joseph, Richboro, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 349,294, April 9, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 512,838

Int. Cl.² C10B *45/02, 53/00*

U.S. Cl. 201—6 **2 Claims**

1. In the process of producing briquettes from mixtures of bituminous binder and reactive coal calcinates made by (1) treating ground coal to at least 250° F and below tar-producing temperatures in the presence of oxygen to produce catalyzed coal particles; (2) shock-heating the catalyzed particles to tar-producing temperatures, typically 500° to 900° F, in a fluidized-bed carbonizer or series of them, to remove substantially all of the condensible vapors overhead; (3) then further heating the particles to higher temperatures, typically 1400° to 1600° F gas exit temperature, to remove noncondensible volatiles to produce a reactive coal calcinate which contains preferably not in excess of about 3% of volatiles, but at least 1% of hydrogen; and (4) cooling the calcinate in an inert atmosphere to a temperature at which it can be handled in air, in which the calcinate and bituminous binder are mixed into a compressible blend, the blend is briquetted into green briquettes, and the green briquettes are cured in an oxygen-containing atmosphere to produce strong cured briquettes which can be coked to briquettes with a volatile content of under 3%, the improvement which comprises applying water to the calcinate before admixture of said calcinate with said bituminous binder whereby it absorbs a minimum of about 3% based on the weight of calcinate up to the saturation level of the calcinate, and using as the binder a by-product coke oven pitch.

3,996,109

COKE OVEN BATTERY HAVING TWIN HEATING FLUES

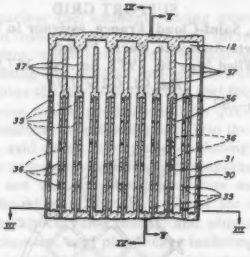
Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed June 2, 1975, Ser. No. 583,036

Claims priority, application Germany, June 5, 1974, 2427032

Int. Cl.² C10B *5/12, 5/14, 21/06, 21/10*

U.S. Cl. 202—141 **4 Claims**



1. A coke oven battery of the type heated regeneratively by the combustion of lean gas and air, comprising the combination of:

horizontally-spaced coking chambers with vertically-extending heating walls at the sides of each coking cham-

ber, two of said heating walls forming a heating chamber in the space between adjacent coking chambers,

a plurality of header walls subdividing each heating chamber into a plurality of separate twin heating flues with successively arranged pairs of upgoing and downgoing heating flues being arranged along each of said coking chambers, each of said header walls having two separate internal ducts separately communicating with a plurality of vertically-spaced exit ports arranged along opposite sides of each header wall such that air and lean gas are supplied from said exit ports into only the upgoing heating flues of each twin heating flue,

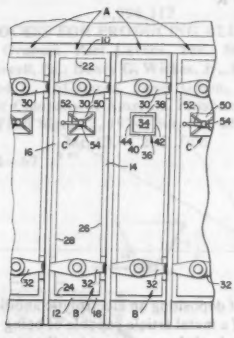
air and lean gas supply means separately coupled to said internal ducts in the header walls in a manner such that air and lean gas are separately supplied to separate ducts for each twin heating flue, the plurality of exit ports discharging air into upgoing heating flues of each twin flue having cross-sectional sizes that increase upwardly along the header wall from port-to-port, and

means to control the amount of air supplied into the internal ducts of said upgoing heating flues to effect incomplete combustion of the lean gas at the sole and lower part of the upgoing heating flues and complete combustion of smoke gas discharged from the twin heating flues.

3,996,110
COKE OVEN LEVELER DOOR

Patsie Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 16, 1975, Ser. No. 613,817
Int. Cl.² C10B *25/02, 25/16*
U.S. Cl. 202—248 **11 Claims**

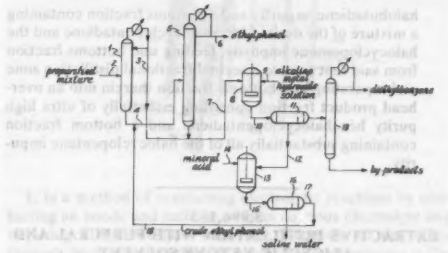


1. In a coke oven of the type having a coke oven door providing access to the inside of said oven and wherein said oven door includes a leveler opening therein which may be selectively covered by a generally rectangular leveler door mounted in close spaced proximity thereto and movable between open and closed positions, the mounting of said leveler door including biasing means for exerting a continuous biasing force against the outside of said leveler door at least when said door is in said closed position, the improvement comprising: said leveler door being constructed from a mild steel plate having substantially flat inner and outer faces with said inner face covering said leveler opening when said leveler door is in said closed position, gusset members rigidly affixed to said outer face by means of intermittent welds spaced longitudinally therealong and positioned so as to extend radially outward from the central portion of said outer face toward each of the corners in the generally rectangular configuration thereof with said gusset members decreasing in height from said central portion toward said corners; means on said outer face for mounting said leveler door in operative communication with said biasing means; a knife-like sealing edge extending outwardly of said inner face from adjacent the outer peripheral edge thereof; and, sealing edge retaining means rigidly affixed to said inner face and interposed between said inner face and sealing edge for retaining said sealing edge in position, said retaining means including an outwardly facing seal receiving groove for receiving said sealing edge therein with said groove having a lesser depth at least adjacent the corner areas of said leveler door with said sealing edge affixed to said retaining means at least at said areas of lesser depth, the remainder of said sealing edge between said areas of lesser depth being spaced outwardly from the bottom of said seal receiving groove.

3,996,111
RECOVERING ETHYLPHENOL FROM DECOMPOSITION PRODUCTS OF DIETHYLBENZENE MONOHYDROPEROXIDE

Jacques Daniel Victor Hanotier, Lambert, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Oct. 28, 1975, Ser. No. 626,264
Int. Cl.² B01D *3/00, 3/34;* **C07C** *29/00*
U.S. Cl. 203—37 **3 Claims**



1. A process for recovering and separating substantially pure ethylphenol and substantially pure diethylbenzene from a mixture resulting from the decomposition of diethylbenzene monohydroperoxide and consisting essentially of diethylbenzene, ethylphenol and oxygenated by-products thereof, said process comprising distilling said mixture in a first distillation step to separate a distillate comprising essentially diethylbenzene from a first residue comprising ethylphenol and the oxygenated by-products of said mixture, withdrawing said residue and distilling said first residue in a second distillation step to separate a distillate consisting essentially of ethylphenol from a second residue containing from 30 to 40 mole % of ethylphenol in admixture with said oxygenated by-products, withdrawing said second residue and mixing it with the distillate from the first distillation step, treating the resulting mixture with an aqueous alkaline solution to form an aqueous extract and a raffinate, recovering ethylphenol from said extract and distilling said raffinate in a third distillation step to obtain a distillate consisting essentially of diethylbenzene.

3,996,112
DISTILLATION OF HEXAHALOCYCLOPENTADIENE

George C. Woehr, Buffalo, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

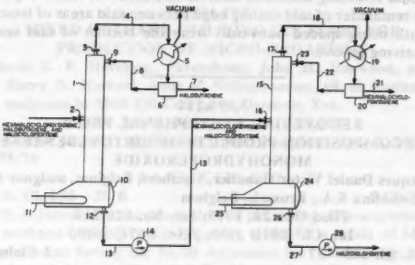
Continuation-in-part of Ser. No. 194,460, Nov. 1, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 461,054
Int. Cl.² B01D *3/34*
U.S. Cl. 203—38 **22 Claims**

1. The process for preparing ultra high purity hexahalocyclopentadiene containing less than about 0.5 weight percent of halocarbon impurity from a crude hexahalocyclopentadiene mixture comprising hexahalocyclopentadiene and halobutadiene, halocyclopentene and ketonic impurities which comprises:

1. pretreating said crude hexahalocyclopentadiene mixture

to remove said ketonic impurities by reacting said mixture with a member of the group consisting of gaseous ammonia, phenylhydrazine, semicarbazone and toluhydroquinone, whereby said ketonic impurities are converted to solid product,

2. feeding the resultant pretreated mixture to a first fractional distillation zone and separating said mixture into an overhead fraction containing substantially all the



halobutadiene impurity and a bottoms fraction containing a mixture of the desired hexahalocyclopentadiene and the halocyclopentene impurtiy, feeding said bottoms fraction from said first zone to a second fractional distillation zone and separating said bottoms fraction therein into an overhead product fraction consisting essentially of ultra high purity hexahalocyclopentadiene and a bottom fraction containing substantially all of the halocyclopentene impurity.

3,996,113

EXTRACTIVE DISTILLATION WITH FURFURAL AND ALICYCLIC KETONE SOLVENT

Val G. Henneberg, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 387,920, Aug. 13, 1973, Pat. No. 3,890,208. This application Mar. 3, 1975, Ser. No. 554,505
Int. Cl.² B01D *3/40*
U.S. Cl. 203—58 **10 Claims**

1. In an extractive distillation to separate mixtures of C_4 to C_5 hydrocarbons selected from the group consisting of saturated and ethylenically unsaturated hydrocarbons of like carbon number and different degrees of saturation including the steps of introducing a selective solvent to an extractive distillation column, introducing said hydrocarbon mixtures to be extractively distilled at a point below the point of introduction of said selective solvent, selectively extracting unsaturated hydrocarbon to form a liquid solvent fraction rich in the more unsaturated hydrocarbon, withdrawing a vaporous hydrocarbon fraction as overhead from the top of said extractive distillation column, and withdrawing the solvent rich in the more unsaturated hydrocarbon from the bottom of said distillation column, wherein the improvement comprises employing as said selective solvent 88 to 99 weight percent furfural and from about 1 to 12 weight percent of an alicyclic ketone having from 5 to 8 carbon atoms and a boiling point in the range of about 130° to 180° C, said weight percent being based on dry solvent.

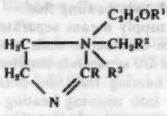
3,996,114

ELECTROPLATING METHOD

Robert F. Ehrsam, Monroe, Conn., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of, Conn.

Filed Dec. 17, 1975, Ser. No. 641,645
Int. Cl.² C25D *15/02, 3/02*
U.S. Cl. 204—16 **10 Claims**

1. In the method of electrolytically depositing on the surface of a substrate metal a layer of a metal having a plurality of discrete particles of a finely divided solid non-metallic material uniformly dispersed throughout said layer, said metal layer and said particles being co-deposited from an aqueous acidic electrolyte solution containing said metal in solution and said particles in suspension therein, said electrolyte solution containing a surface active agent desposition promoter for the non-metallic, and being agitated to maintain the particles uniformly in suspension therein, the improvement which comprises employing as said deposition promoter a surface active agent selected from the group having the chemical structure:



Where

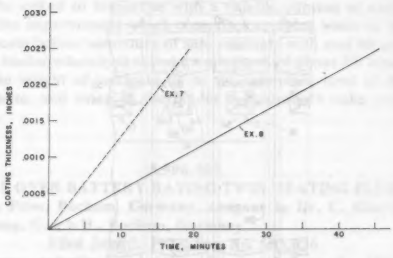
R is a fatty acid radical having from 6 to 18 carbon atoms.
R^1 is H, Na or CH_2COOM
R^2 is COOM, CH_2COOM or $CH(OH)CH_2SO_3M$
R^3 is OH, and
M is H or Na or an organic base

3,996,115

PROCESS FOR FORMING AN ANODIC OXIDE COATING ON METALS

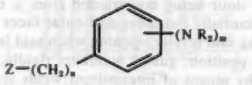
Saul Kessler, Canoga Park, Calif., assignor to Joseph W. Aidlin, Los Angeles, Calif.

Filed Aug. 25, 1975, Ser. No. 607,127
Int. Cl.² C25D *11/34, 11/26, 11/30*
U.S. Cl. 204—56 R **11 Claims**



1. A method of depositing an electrolytic anodic oxide layer on the surface of a metal article capable of being converted to a passivated metal salt layer comprising the steps of:

applying to the surface of the article an aqueous anodizing electrolyte containing an effective amount of oxidant capable of forming an anodic oxide on the metal surface and 0.1 to 50 g/l of an additive comprising the reaction product of (a) a halogenated compound of fluorine, chlorine, iodine or bromine and an inorganic cation selected from Groups 1*b*, 2, 3*a*, 4*b*, 5*b*, 6*b* or 8 and (b) an alkarylamine of the formula:



where *n* is an integer from 1 to 4, m is an integer from 1–2 and R is selected from hydrogen, lower alkyl of 1–9 carbon atoms, lower alkanol of 1–8 carbon atoms, aryl or aralkyl and Z is hydrogen or CX_3 where X is fluoro, chloro, bromo, iodo or R:

making the article the anode in the electrolyte;

applying a current density between 5 to 200 amps/dm² ;and

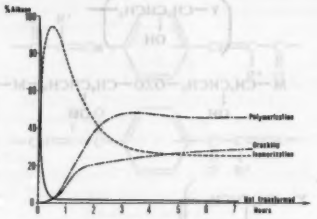
depositing an anodic oxide layer on said surface.

3,996,116

PROCESS FOR THE CONVERSION OF STRAIGHT CHAIN SATURATED HYDROCARBONS

Michel Paul Herlem; Francis Bobillard, and André Thiebault, all of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed May 20, 1975, Ser. No. 579,189
Int. Cl.² C25B *3/00*; C07C *5/22*
U.S. Cl. 204—59 R 9 Claims



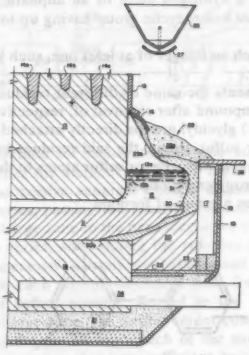
1. A process for converting straight chain saturated hydrocarbons into branched chain saturated hydrocarbons comprising oxidizing the hydrocarbons in liquid phase in the presence of a superacid by electrolysis at a voltage in the range of between the half wave voltage of the hydrocarbon and that of the superacid.

3,996,117

PROCESS FOR PRODUCING ALUMINUM

Robert W. Graham, Port Lavaca, Tex.; Stanley C. Jacobs, Lower Burrell, Pa.; Henry G. Wickes, Jr., Port Lavaca, Tex., and Alfred F. LaCamera, Level Green, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,374
Int. Cl.² C25C *3/06*
U.S. Cl. 204—67 9 Claims



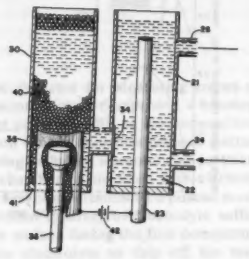
1. In a process for producing aluminum, which process conventionally includes electrolytically decomposing alumina to aluminum metal in a molten electrolyte bath between a carbon anode and a cathodic interface formed between a molten aluminum metal pad and the electrolyte bath, the bath
a. being predominantly NaF and AlF_3,
b. containing CaF_2 and Al_2O_3, and
c. being covered by a crust,
the improvement comprising providing in the bath 5 to 10 weight-% LiF, while maintaining in the bath a weight ratio NaF to AlF_3 of 1.04 to 1.15, and while maintaining a frozen layer bounding the sides of the aluminum metal pad and bath, with the bath temperature during electrolytic decomposition being less than 940° C.

3,996,118

METHOD FOR PROMOTING REDUCTION-OXIDATION OF ELECTROLYTICALLY PRODUCED GASES

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 252,285, May 11, 1972, Pat. No. 3,849,278. This application Aug. 16, 1974, Ser. No. 498,084
Int. Cl.² C25B *1/00*, *9/00*
U.S. Cl. 204—91 3 Claims



1. In a method of conducting electrolytic reactions by contacting an anode and cathode with an aqueous electrolyte and imposing a current flow from one electrode to the other through the electrolyte thereby producing hydrogen gas at the cathode, the improvement comprising:
a. positioning a fixed static bed of solid particles selected from the group consisting of carbon particles, activated carbon particles, and platinized compound particles, in a fixed, static condition adjacent the cathode so as to receive the hydrogen gas electrolytically produced at the cathode,
b. introducing a second gas capable of oxidizing said hydrogen gas directly into said fixed static bed of solid particles without disrupting the non-turbulent condition of said fixed static bed, and
c. introducing an aqueous solution into contact with said solid particles, said solid particles being essentially inert with respect to said hydrogen gas, said second gas, said aqueous solution, and the reaction product of said reaction and each solid particle being wetproofed by treatment with a substance not wetted by said aqueous solution in order to effectively promote the non-electrolytic oxidation of said hydrogen gas.

3,996,119

METHOD FOR ELECTROLYTIC ETCHING OF GRAY IRONS WITH STEAD'S REAGENT

Russell D. Burkhart, Black Hawk County, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 2, 1976, Ser. No. 654,417
Int. Cl.² C25F *3/06*
U.S. Cl. 204—129.85 7 Claims

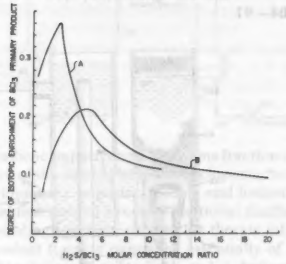
1. A process for electrolytically etching phosphorus bearing gray irons which comprises
a. immersing a phorphorus-containing gray iron sample in a bath of Stead's reagent, and
b. passing a direct current through said bath between said sample and a cooperating electrode to electrolytically etch the surface of the sample sufficient for microscopic or mascroscopic examination thereon.

3,996,120

LASER-INDUCED PHOTOCHEMICAL ENRICHMENT OF BORON ISOTOPES

Samuel M. Freund, Gaithersburg, and Joseph J. Ritter, Mount Airy, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,346
Int. Cl.[2] B01J *1/10*; C01B *35/06*
U.S. Cl. 204—157.1 R 14 Claims



1. A photochemical method for the selective enrichment of either boron-10 isotopic content or boron-11 isotopic content of boron trichloride starting material containing a first species of BCl_3 molecules wherein the boron atoms are boron-10 and a second species of BCl_3 molecules wherein the boron atoms are boron-11, comprising the steps of:

a. forming a gaseous mixture at a reduced pressure in a closed reaction chamber of said boron trichloride starting material and a sulfide selected from the group consisting of H_2S and D_2S;

b. irradiating said gaseous mixture with infrared radiation from a carbon dioxide TE laser, the wavelength of said radiation selectively coinciding with the B-Cl stretching transition in one of said first or second species of BCl_3 molecules, thereby selectively exciting said one species of BCl_3 molecules and making it preferentially more reactive with said sulfide;

c. continuing said irradiation of said gaseous mixture for a period of time sufficient to form a solid reaction product in said reaction chamber; and

d. recovering from the resulting gaseous phase in said reaction chamber a boron trichloride primary product selectively enriched in either the boron-10 isotope or the boron-11 isotope.

4. The method of claim 1, wherein said boron trichloride primary product is recovered from said gaseous phase remaining in said reaction chamber by fractionating said gaseous phase at −130° C to obtain a borane-containing fraction comprising primarily unreacted BCl_3 in admixture with small quantities of sulfhydroboranes; chlorinating said borane-containing fraction with gaseous Cl_2 to form a mixture of gaseous products containing BCl_3, SCl_2 and HCl; fractionating said mixture of gaseous products at −130° C to obtain a BCl_3—SCl_2 fraction; and extracting the SCl_2 from said BCl_3—SCl_2 fraction with mercury to obtain said pure boron trichloride primary product.

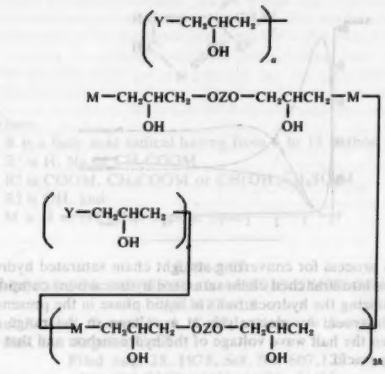
3,996,121

RADIATION POLYMERIZABLE ESTERS

George Edward Green, Cherry Hinton, England, and Ewald Losert, Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

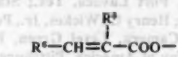
Filed Feb. 10, 1975, Ser. No. 548,702
Claims priority, application United Kingdom, Feb. 22, 1974, 8105/74
Int. Cl.[2] C08F *2/46*, *4/00*
U.S. Cl. 204—159.23 11 Claims

1. Process for polymerising an ester of the formula



where

Y represents an olefinic acyloxy group of formula R^6



wherein

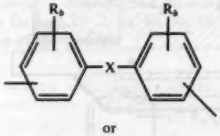
R^5 represents a hydrogen, chlorine, or bromine atom, a cyano group, or an alkyl group of up to 4 carbon atoms, and

R^6 represents a hydrogen atom or an aliphatic, aromatic, araliphatic or heterocyclic group having up to 12 carbon atoms,

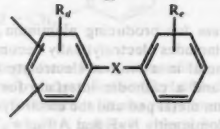
a and *c* are each an integer of at least one, such that $(a+c)$ is at least 3,

each M represents the same or different residue of a polyglycidyl compound after removal of, respectively, $(a+1)$, 2, and $(c+1)$ glycidyl groups directly attached to oxygen, nitrogen, or sulfur atoms, the said residues being linked through oxygen, nitrogen, or sulfur atoms to the indicated 2-hydroxypropylene groups,

each Z denotes a group of formula



or



wherein

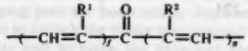
each R represents a halogen atom, an alkyl, cycloalkyl, alkenyl, alkoxy, or carbalkoxy group containing up to 9 carbon atoms, a nitro group, or a carboxyl or sulphonic acid or phosphonic acid group in the form of a salt,

each *b* represents zero or an integer of 1 to 4,

d represents zero or an integer of 1 to 3,

e represents zero or an integer of 1 to 5, and

X represents a chain of carbon atoms containing in that chain a grouping of formula



or

or

wherein

R^1 and R^2 individually are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

R^3 and R^4 are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, and

f and *g* are each zero, 1, or 2, with the proviso that they are not both zero, and

h is zero or a positive integer of up to 50, which comprises subjecting said ester to actinic radiation.

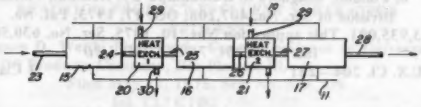
3,996,122
CORONA REACTION SYSTEM

Frank E. Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 387,972, Aug. 13, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 579,739

Int. Cl.² C01B *13/11*

U.S. Cl. 204—176 **9 Claims**



1. In a method for conducting corona induced reactions which includes the steps of subjecting a gas to corona in at least two successive separate corona discharge zones connected in series, passing the reaction product gas from each corona discharge zone to the next successive corona discharge zone in the series, and cooling the reaction product gas between the successive corona discharge zones to remove heat generated in each corona discharge zone from the reaction product gas before passage thereof to the next successive corona discharge zone, the improvement comprising:

a. flowing the gas through each of the successive corona discharge zones at a rate sufficient to remove substantially all of the excess heat of reaction therefrom by the gas flow;

b. maintaining a power consumption in each of the successive corona discharge zones in the range of from about 1000 to 100,000 watts/ft² of discharge electrode surface; and

c. reducing the temperature of the reaction product gas in the cooling between successive corona discharge zones by at least 100° C.

3,996,123
COULOMETRIC DETECTOR

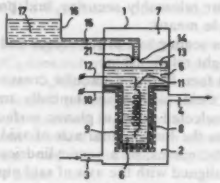
Johan Christiaan Willem Kruishoop, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 562,964

Claims priority, application Netherlands, Apr. 8, 1974, 7404737

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **10 Claims**



1. A coulometric detector for measuring traces of a gas component in a gaseous mixture comprising, a housing having a first compartment provided with an inlet connection and a discharge connection for the flow of a gaseous mixture to be analyzed, said housing including a second compartment forming an electrolyte chamber partly filled with electrolyte and separated from the first compartment by a porous membrance for passing a controlled quantity of electrolyte sufficient to wet the membrance surface facing the first compartment but insufficient to allow electrolyte to drip off the membrane surface, said electrolyte containing a solvent for substances which react with said gas component when in contact with measuring electrodes, a first electrode disposed in the second compartment as an internal electrode and a second electrode disposed in the first compartment as an external electrode, the external electrode comprising a metal layer covering the membrane layer but in a manner so as to leave the pores of the porous membrane layer free, a supply tube terminating in the second compartment at a point above the electrolyte level, said tube being connected to a storage vessel containing only solvent to replenish any solvent which is lost by evaporation from the detector housing.

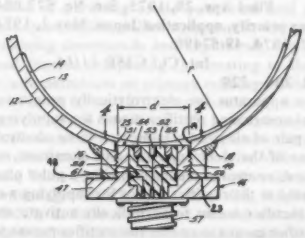
3,996,124
FLUSH MOUNTED CORROSION PROBE ASSEMBLY FOR PIPELINE

Paul E. Eaton, Cedar Hill, and Robert R. Annand, St. Louis, both of Mo., assignors to Petrolite Corporation

Filed July 30, 1975, Ser. No. 600,671

Int. Cl.² G01N *27/46, 27/30*

U.S. Cl. 204—195 C **3 Claims**



1. A flush mounted probe assembly for monitoring the corrosion environment within a thin boundary liquid film disposed along the interior sidewall surface of a pipeline carrying fluids comprising:

a. nipple means secured to a cylindrical pipeline having an internal radius *r*, and said nipple having an axial cylindrical opening therethrough aligned with a circular cross-sectioned opening within the sidewall of said pipeline;

b. probe means comprising a metal member with a circular cross-section received within said nipple means, and said probe means projecting snugly into said opening in said sidewall and terminating in an end face residing in substantial alignment with the interior sidewall surface of said pipeline;

c. means for releasably securing said probe means within said nipple means;

d. means for sealing said probe means and nipple means into a fluid-tight relationship;

e. said end face having a circular cross-section exposed to pipeline fluids with a substantially smooth imperforate surface selected from a planar surface disposed transversely to the longitudinal axis of said metal member of said probe means, or a semicylindrical smooth concave surface aligned with the axis of said pipeline and having a radius of curvature not less than the radius r of said pipeline;

f. said end face is circular in cross-section with a diameter d and related to the internal radius *r* of said pipeline by the formula: $r \geq 1.25(d)^2$ where in the formula the terms *r* and *d* are dimensioned in inches, whereby said end face is contoured and dimensioned within said opening to substantially conform to the adjacent interior sidewall surface of said pipeline without a surface discontinuity greater than 100 mils in thickness to disrupt the thin boundary liquid film disposed along the interior sidewall surface of said pipeline;

g. electrode means carried by said probe means on said end face, and said electrode means provided by a plurality of metal electrodes having smooth exposed surfaces merging with and forming in part said smooth imperforate surface on said end face, and said metal electrodes separated from one another by an insulator means carried centrally with said end face and forming a portion of said smooth imperforate surface; and

h. electrical conductor means connected to said metal electrodes and carried by said probe means, and said conductor means extending in electrical isolation from said probe means to form an external circuit connection.

3,996,125

APPARATUS FOR ELECTROLYTICALLY PROCESSING ALUMINIUM MATERIAL

Morinobu Kondo, Nagoya, and Toshiro Takahashi, Shizuoka, both of Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, and Kabushiki Kaisha Chuo Seisakusho, Nagoya, both of Japan

Filed Apr. 28, 1975, Ser. No. 572,084

Claims priority, application Japan, May 2, 1974, 49-49521; May 22, 1974, 49-57496

Int. Cl.² C25D *11/14*

U.S. Cl. 204—228 **9 Claims**

1. An apparatus for electrolytically processing aluminum material comprising rectifier means for supplying power to at least a pair of electrodes immersed in an electrolytic bath, at least one of the electrodes being of aluminum material to be processed, controller means including a pulse phase generator connected to the rectifier means for supplying a control signal to the rectifier means to periodically activate and deactivate the rectifier means to enable the rectifier means to have a feed time and a quiescent time for producing a pulse power output to the electrodes, and by-pass circuit means connected between the electrodes for discharging between power pulses the electric charge stored in the electrolytic bath during the power pulses.

3,996,126

MEANS FOR REMOVAL OF ADSORBED FILM AND MICROORGANISMS FROM TEETH AND ORAL CAVITIES

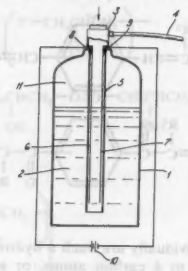
Oystein E. Rasmussen, Hosleveien 119, 1340 Bekkestua, Norway

Filed Oct. 31, 1974, Ser. No. 519,659

Claims priority, application Norway, Nov. 28, 1973, 4307/73

Int. Cl.² C25B *1/26, 9/00*

U.S. Cl. 204—271 **9 Claims**



1. Apparatus for removing adsorbed film and microorganisms from teeth and the oral cavity comprising a an aerosol can holding a neutral salt water solution, said can being provided with a device for spraying of the solution, means defining a compartment arranged in connection with the spray device so that solution to be sprayed passes through said compartment, said compartment containing two spaced-apart electrodes which, via contact points are connected to a current source so that solution passing through said compartment is electrolyzed to produce decomposition products.

3,996,127

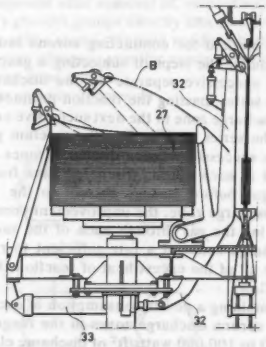
DEVICE FOR DETACHING AN ELECTROLYTICALLY PRECIPITATED METAL SHEET FROM A CATHODE

Pentti J. Rautimo, Helsinki, and Aarne A. Kapanen, Pori, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Division of Ser. No. 407,208, Oct. 17, 1973, Pat. No. 3,935,091. This application Nov. 10, 1975, Ser. No. 630,508

Int. Cl.² C25C *7/08*; C25D *1/20*

U.S. Cl. 204—281 **1 Claim**



1. A device for detaching an electrolytically precipitated metal sheet, especially a copper, nickel or zinc sheet, from a base plate working as a cathode, which comprises:

means for holding the base plate rigidly in an essentially vertical position,

blades mounted for limited downward movement to initially detach the upper edge of the precipitated metal sheet at least locally from the base plate by movement of said blades between said upper edge and said base plate,

gripping jaws, for gripping the detached upper edge, said gripping jaws being carried by the upper end of a turning arm, said turning arm being pivotally mounted for movement between an upright position and a position at which the gripping jaws are horizontally displaced to an extent sufficient to detach the entire precipitated sheet from the base plate and to place the detached sheet on a sheet stacking device, said turning arm being driven by a working cylinder.

3,996,128
ISOBUTANE CONVERSION OF NAPHTHA IN PRETREATER DESULFURIZATION

Wilton F. Espenscheid, Princeton, and Tsoung Y. Yan, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

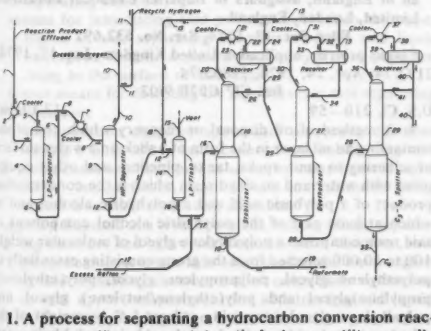
Continuation-in-part of Ser. No. 456,586, April 1, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,563
Int. Cl.² C01G *23/00*
U.S. Cl. 208—89 **9 Claims**

1. In a process wherein a naphtha feedstock containing over 5 ppm of sulfur is pretreated prior to reforming by contacting said feedstock with a supported noble metal catalyst under desulfurization conditions including a temperature in the range of between about 400° F and about 725° F in the presence of hydrogen at a pressure of at least 100 but less than 500 psig and a liquid hourly space velocity of from 1 to 6 to reduce the sulfur content of said feedstock to 5 ppm or less and to produce propane and butanes, the improvement which comprises converting said feedstock to achieve at least 5% conversion to propane and butanes, including isobutane, by increasing the temperature in said range at least 10° F to achieve an increased yield of said isobutane in said pretreater, conducting the effluent from said pretreater to a separation zone wherein an isobutane-rich stream is separated from the desulfurized naphtha, conducting said isobutane-rich stream to an alkylation reactor and conducting said desulferized naphtha to a catalytic reformer.

3,996,129
REACTION PRODUCT EFFLUENT SEPARATION PROCESS

James D. Weith, Pierrefonds, Canada, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 12, 1975, Ser. No. 576,779
Int. Cl.² C10G *7/00*, *7/02*
U.S. Cl. 208—102 **11 Claims**



1. A process for separating a hydrocarbon conversion reaction product effluent containing (i) hydrogen, (ii) normally gaseous hydrocarbons and, (iii) normally liquid hydrocarbons, which process comprises the sequential steps of:

a. introducing said effluent into a first separation zone, at a lower temperature, to provide a hydrogenrich first vaporous phase and a first liquid phase;

b. introducing said first liquid phase into a second separation zone, at substantially the same temperature and a reduced pressure, to provide a second liquid phase and to recover a C_1/C_2 concentrated second vaporous phase;

c. separating said second liquid phase, in a first fractionation zone, at fractionation conditions selected to provide (i) a C_5-plus concentrated normally liquid hydrocarbon stream and, (ii) a C_4-minus concentrated third vaporous phase;

d. condensing and separating said third vaporous phase to recover a C_1/C_2 concentrated fourth vaporous phase and to provide a first C_3/C_4 concentrated stream;

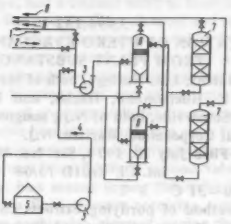
e. separating at least a portion of said first C_3/C_4 concentrated stream, in a second fractionation zone, at fractionation conditions selected to recover a second C_3/C_4 concentrated stream and to provide a C_1/C_2 concentrated fifth vaporous phase; and,

f. combining at least a portion of said C_1/C_2 concentrated fifth vaporous phase with said first liquid phase and introducing the resulting mixture into said second separation zone.

3,996,130
METHOD OF PURIFYING CRUDE PETROLEUM AND PRIMARY REFINING PRODUCTS

Nikolai Sergeevich Nametkin, Leninsky Prospekt, 13, kv. 11; Sergei Pavlovich Gubin, ulitsa, 40, kv. 5; Vladimir Dmitrievich Tjurin, Leninsky prospekt, 67, kv. 33; Viktor Viktorovich Fedorov, 3 Samotechny pereulok, 23, kv. 88, all of Moscow; Leonid Ivanovich Larionov, ulitsa Minina, 15-a, kv. 8, Gorky; Vladimir Alexandrovich Kozin, ulitsa Gastello, 32, kv. 52, Gorky; Naum Borisovich Zhadanovsky, ulitsa Kovalikha, 93-a, kv. 1, Gorky, and Ruslan Yakovlevich Barashkov, Bezbozhny pereulok, 19, korpus 17, kv. 4, Moscow, all of U.S.S.R.

Filed Jan. 3, 1974, Ser. No. 430,565
Int. Cl.² C10G *29/04*, *29/06*
U.S. Cl. 208—243 **21 Claims**



1. A method of purifying crude petroleum and primary refining products of sulfur, sulfur compounds, nitrogen- and oxygen- containing compounds and naphthenic acid impurities contained therein comprising (a) treating in the liquid phase said crude petroleum or primary refining products at a temperature of from 80° to 120° C with a metallic compound selected from the group consisting of (1) π-complexes, (2) π-allylic complexes and (3) carbonyl complexes of transition metal elements selected from Groups Vb, VIb, VIIb and VIII of the Periodic Table of Elements and (4) salts selected from the group consisting of $RhCl_3 \cdot 3H_2O$, Na_2PtCl_4, Na_2PtCl_6 and $(C_6H_5CN)_2\ PdCl_2$ to form complexes of said metallic compound with said impurities and (b) separating said complexes from the resulting reaction mixture by treating said mixture with a β-diketone chelating agent reactive with said complexes at a temperature of from 100° C to 200°C. and (C) separating said complexes from said reaction mixture.

15. A method of purifying crude petroleum and primary

refining products of sulfur, sulfur compounds, nitrogen- and oxygen- containing compounds and naphthenic acid impurities contained therein comprising treating in the liquid phase said crude petroleum or primary refining products at a temperature of from 80° C to 120° C with a metallic compound selected from the group consisting of (1) π -complexes, (2) π -allylic complexes and (3) carbonyl complexes of transition metal elements selected from Groups Vb, VIb, VIIb and VIII of the Periodic Table of Elements and (4) salts selected from the group consisting of $RhCl_3 \cdot 3H_2O$, Na_2PtCl_4, Na_2PtCl_6 and $(C_6H_5CN)_2PdCl_2$ to form complexes of said metallic compound with the impurities and separating said complexes from said crude petroleum oil or said primary refining products to obtain the purified product from the resulting reaction mixture by treating said reaction mixture with a chelating agent reactive with the metallic complexes and selected from the group consisting of O-phenanthroline, α, α' -dipyridyl and acetylacetone at a temperature of from 100° C to 200° C, followed by distilling off the purified product.

3,996,131

PRECOAT FOR PERMEABILITY SEPARATION SYSTEMS

William Maxwell Conn, La Mesa, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 153,789, June 16, 1971, abandoned. This application May 29, 1973, Ser. No. 364,797

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **13 Claims**

1. In the treatment of raw sewage containing hydrophobic and greasy materials by passage through an ultrafiltration membrane such that there will be fouling of the membrane, the method of operation to preclude fouling thereof which comprises depositing upon said membrane a mixed coating of a solid adsorbent and a solid absorbent in a quantity of about 6 to 60 grams per 1,000 square feet of membrane, and passing through said coating a feed consisting essentially of the raw sewage, prior to contact of said feed with the membrane, to remove the membrane-fouling hydrophobic and greasy materials from said raw sewage.

3,996,132

PURIFICATION OF UTERO-EVACUANT EXTRACTS FROM PLANT SUBSTANCES

Jose Luis Mateos; Luis Noriega, both of Mexico City, Mexico; Richard E. Huettemann, Hazlet, and Ramesh Maganlal Kanojia, Somerville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed July 18, 1974, Ser. No. 489,688

Int. Cl.[2] G01D *15/08*

U.S. Cl. 210—31 C **16 Claims**

1. The method of purifying extracts containing materials obtained from the zoapatle plant which comprises the steps of

a. treating said extract with a water-immiscible organic solvent,

b. treating the resulting solution with an aqueous solution of a mild base to remove water soluble and acidic impurities,

c. passing the materials soluble in the organic phase at least once over a chromatography column of adsorbent material to separate from said phase said materials, and

d. eluting the column with a second solvent or a mixture of solvents.

3,996,133

CALCIUM RECLAMATION PROCESS

Orris E. Albertson, Belmont, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 11, 1975, Ser. No. 567,327

Int. Cl.[2] C02B *1/20*

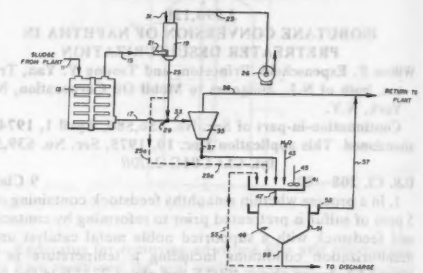
U.S. Cl. 210—45 **15 Claims**

1. A process for reclaiming calcium values from a calcium and phosphate-bearing sludge that has been formed by lime dosage of sewage in a sewage treatment plant, or from a calcium sludge containing undesirable inerts derived from the lime treatment of turbid waters for potable or industrial purposes, said process comprising:

a. calcining the sludge in a first zone to release combustion gases therefrom and to produce a residual mixture of dried solid particulates including calcium-oxide solids, calcium-phosphate solids, and ash;

b. conveying the residual solid mixture from said calcining zone to a second zone;

c. in said second zone, classifying the dried solids in a classification apparatus and forming two streams of classified particles, the first of which contains solid particles which are larger than about 50 microns in diameter, and the



second of which contains particles which are smaller than about 50 microns in diameter said second stream including between about 40 and 75 percent of said calcium oxide solids;

d. returning the second stream of classified solid particles to the sewage treatment plant without further classification or separation;

e. conveying the first stream of solid particles to a third zone and there mixing said first stream with water to form an aqueous solution inclusive of dissolved calcium;

f. then conveying said aqueous solution into a fourth zone comprising a generally quiescent body of liquid wherein insoluble solids settle to form a sediment; and

g. removing a decanted stream of the aqueous solution of dissolved calcium from the third zone and thence returning the decanted stream to the sewage treatment plant.

3,996,134

METHOD OF DISPERSING OIL IN WATER

Peter George Osborn, Bourne End; Peter Francis Nicks, Maidenhead, and Michael George Norton, Burnham-on-Crouch, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1974, Ser. No. 532,692

Claims priority, application United Kingdom, Jan. 17, 1974, 2192/74; Apr. 24, 1974, 17883/74

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—59 **13 Claims**

1. A method of oil disposal or recovery which comprises contacting an oil layer in the form of a slick on a water surface or adhering to sand, rocks, tanks, pipelines and other equipment with water and an alkyd resin which is the condensation product of a polybasic acid and a polyhydric alcohol and in which at least part of the polyhydric alcohol component of said resin comprises a polyalkylene glycol of molecular weight 100 to 10,000 selected from the group consisting essentially of polyethylene glycol, polypropylene glycol, poly(ethylene/-propylene)glycol and poly(ethylene/butylene) glycol and polyalkylene glycol comprising at least 5 % by weight of the alkyd resin and said polyalkylene glycol being soluble in water whereby the oil is dispersed in the water wherein said alkyd resin is dissolved or dispersed in an inert liquid carrier.

3,996,135

CATALYST FOR SULFITE SCAVENGERS

James R. Stanford, Sugar Land; John H. Martin, Fresno, and George D. Chappell, Rosenberg, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 6, 1976, Ser. No. 683,974
Int. Cl.² C02B 1/36; C23F 15/00; E21B 21/00
U.S. Cl. 210—62 3 Claims

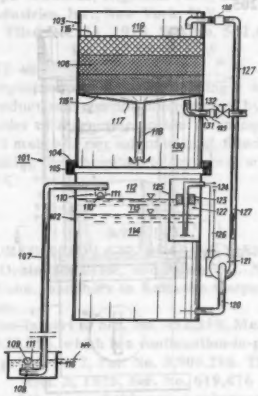
1. A method of scavenging oxygen from aqueous fluids of the type wherein a water soluble bisulfite or sulfite is added to such waters as the scavenger, the improvement which comprises using as a catalyst for the water soluble bisulfite or sulfite a compound from the group consisting of ClO_2 and its water-soluble salts.

3,996,136

PUMP-FILTER FOR BILGE WATER

Peter Jakubek, 48, Heinrich Collinstrasse, A-1140 Vienna, and Karl Biswanger, Schottenfeldgasse 77, A-1070 Vienna, both of Austria

Continuation-in-part of Ser. No. 342,252, March 16, 1972, Pat. No. 3,852,193. This application Dec. 4, 1974, Ser. No. 528,938
Claims priority, application France, Nov. 15, 1974, 74.37724
Int. Cl.² B01D 35/00
U.S. Cl. 210—86 7 Claims



1. An apparatus for purifying a polluted liquid containing a liquid pollutant having a lower specific gravity than said polluted liquid, said apparatus comprising:

a separating chamber;

means for introducing said polluted liquid into the upper region of said separating chamber whereby said liquid undergoes therein a preseparation with said pollutant rising to the surface of said liquid;

sensor means for detecting the liquid level in said separating chamber;

a compensation chamber above said separating chamber having a filter above said sensor means subdividing said compensation chamber into an upper compartment and a lower compartment, said lower compartment being sealed from said separating chamber;

a pump disposed at a level above the bottom of said separating chamber and below said compensation chamber, said pump having an intake side connected to the lower region of said separating chamber and an output side connected to said upper compartment for withdrawing said liquid from said separating chamber and introducing same into said chamber;

a duct for drawing filtered liquid from said lower compartment;

an inlet opening into said separating chamber for delivering said polluted liquid thereto, said inlet having a check valve only permitting liquid flow into said separating chamber; and

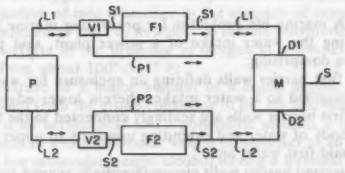
control means connected to said sensor means for operating said pump only when said liquid level is above a predetermined level.

3,996,137

FILTER ASSEMBLIES CONTAINING COAXIAL BIDIRECTIONAL FLOW CONTROL AND RELIEF VALVES

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 356,231, May 1, 1973, Pat. No. 3,908,693. This application Oct. 31, 1974, Ser. No. 519,714
Int. Cl.² B01D 27/10
U.S. Cl. 210—130 41 Claims

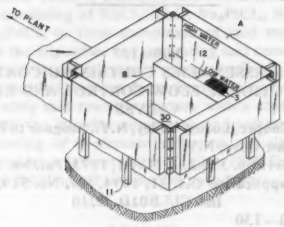


1. A filter assembly comprising, in combination, a fluid line arranged for fluid flow therethrough in either of two directions; a filter element in fluid flow connection with the fluid line, so that flow through the line in at least one direction must pass through the filter element; the filter element having a filter sheet arranged in a closed configuration about an internal passage, with end caps across the ends of the internal passage attached to the filter sheet, at least one of the end caps having an aperture therethrough in fluid flow connection to the internal passage; and a coaxial valve in fluid flow connection with the fluid line and the filter element and responsive to differential fluid pressure thereacross arising from flow of fluid in either direction through the line and a valve flow passage, comprising a tubular valve housing; first and second valve seats in the housing; first and second coaxial tubular valve elements nested concentrically and separately reciprocable within the valve housing towards and away from the first and second valve seats, respectively, between closed and open positions, to close and open first and second valve flow passages, respectively; bias means urging the valve elements in one direction; and a fluid-pressure-receiving surface operatively connected to each valve element, urging the first valve element in a first direction towards or away from its valve seat, and the second valve element in a second direction, towards or away from its valve seat; the biasing force of the bias means being adjusted to resist movement of each valve element in said direction away from or towards its valve seat except under differential fluid pressure arising from flow and applied to the fluid pressure receiving surface from one of the flow directions, and each of the valve elements moving in said direction towards or away from its valve seat and opening when flow begins from that direction and closing when flow stops from that flow direction; the first valve element being responsive to differential fluid pressure arising from flow in one direction from one side of the valve, and the second valve element being responsive to differential fluid pressure arising from flow in the other direction from the other side of the valve, so that the valve is arranged to open or close in response to differential fluid pressure applied from either direction of flow and to direct such flow from the line through the filter element in at least one direction of flow through the line.

3,996,138
MARINE LIFE PROTECTOR

Ernest Daidola, and John C. Daidola, both of 39 Kilburn Ave., Huntington Station, N.Y. 11746

Filed Aug. 2, 1974, Ser. No. 494,125
Int. Cl.² E02B 15/04
U.S. Cl. 210—170 14 Claims



1. A marine life protector for preventing marine life from entering the water intake of a power plant, said protector device comprising:

A. first barrier walls defining an enclosure for water to be supplied to a water intake wherein lower edges of said first barrier walls are sealingly connected to the floor of a body of water and extending upwardly to upper edges of said first walls; and,

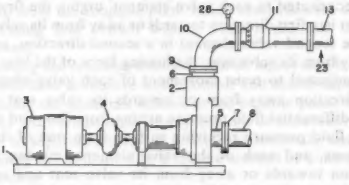
B. second barrier walls circumferentially spaced around and outwardly from said first barrier walls, the lower edges of said second walls being spaced both above said floor and below the upper edges of said first walls, and

C. power plant water intake means extending outwardly from at least one of said first barrier walls for fluid communication of said enclosure with a power plant whereby marine life external to said protector is excluded from water entering said enclosure by said water passing first under the lower edge of said second barrier walls, then over the upper edges of said first barrier walls.

3,996,139
LIQUID WASTE TREATMENT APPARATUS

Jack E. Prince; Franklin E. Terry, both of 2927 31st St., Port Arthur, Tex. 77640, and William H. Mullins, 230 W. King Highway, San Antonio, Tex. 78212

Continuation-in-part of Ser. No. 329,441, Feb. 5, 1973, abandoned. This application May 23, 1975, Ser. No. 580,521
Int. Cl.² B01F 3/04; C02C 1/08
U.S. Cl. 210—198 R 8 Claims



1. A liquid waste treatment unit comprising:

a. a base frame,

b. a pump mounted on said base frame,

c. drive means mounted on said base frame driving said pump,

d. said pump having an inlet and an outlet,

e. coupling means associated with said pump inlet for connecting to a waste liquid source,

f. an aerator connected to said pump outlet and extending generally horizontally therefrom,

g. said aerator including a nozzle discharging into an opening of a mixing chamber of substantially uniform cross sectional area, said mixing chamber communicating directly with an ambient pressure zone of substantially greater cross sectional area, said uniform cross sectional area being of substantially reduced cross sectional area from said pump outlet, and

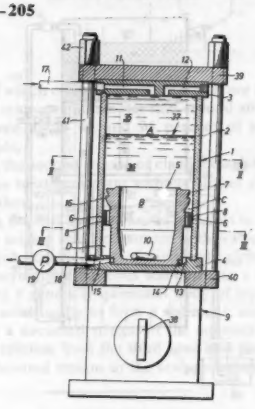
h. coupling means associated with said pump outlet and said aerator for positioning said aerator in selected positions about the pump outlet,

i. said nozzle having an outer diameter in the range of 80% to 90% of an inner diameter of said opening of said mixing chamber.

3,996,140
APPARATUS FOR CONTINUOUS LIQUID-LIQUID EXTRACTION OF WATER WITH A SOLVENT

Björn Olof Josefsson, and Martin Ahnoff, both of Goteborg, Sweden, assignors to AB Tellusond, Goteborg, Sweden

Filed Feb. 7, 1975, Ser. No. 548,018
Int. Cl.² B01D 11/04
U.S. Cl. 210—205 3 Claims



1. Apparatus for extracting dissolved substances from water by means of a solvent, which comprises

an extraction vessel;

a stationary container, having side walls and a bottom but open at the top, arranged in the lower part of the extraction vessel there being an annular gap between the side walls of the container and said vessel;

said container having therein a stirrer, and acting as a mixing container;

an inlet conduit for supplying solvent to the vessel;

an inlet conduit for supplying water to the container, where water is mixed with solvent in the extraction vessel;

an outlet conduit for removing water from the bottom of the annular gap between the extraction vessel and the container; and

means in said annular gap to reduce the turbulence caused by the stirring in the mixture of water and solvent moving down in said annular gap, so that the solvent rises to the upper part of the extraction vessel and only water is removed through the outlet conduit,

said means for reducing the turbulence in the annular gap comprising a partition provided with openings, which partition divides said gap into an upper section and a lower section.

3,996,141

DIALYSIS MEMBRANE

Stuart J. Updike, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 191,720, Oct. 22, 1971, Pat. No. 3,846,236. This application Jan. 17, 1974, Ser. No. 434,231

Int. Cl.² B01D 13/04

U.S. Cl. 210—501 11 Claims

1. A dialysis membrane formed of a high molecular weight film forming material as a continuous phase containing within the membrane an insoluble inorganic catalyst which does not wash out of the membrane and which converts hydrogen peroxide in dilute solution to water and oxygen during passage of the dilute solution of hydrogen peroxide thereinto from one side for release of oxygen from the opposite side in which the catalyst is selected from the group consisting of manganese dioxide, ruthenium oxide, ruthenium sulfide, colloidal silver, colloidal and chelated iron, platinum, silver and gold.

3,996,142

SMOKE AND FIRE RETARDANTS FOR HALOGEN-CONTAINING PLASTIC COMPOSITIONS COMPRISING THE REACTION PRODUCT OF MAGNESIUM OXIDE AND A ZINC SALT OF AN ACID

Edward L. White, Freehold; William E. Robertson, Trenton, and Joseph Schwarcz, Highland Park, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,687

Int. Cl.² C09K 3/28

U.S. Cl. 252—8.1 15 Claims

1. A composition of matter comprising a magnesium-zinc reaction product, said composition prepared by slurrying from 2 to 10 moles of magnesium oxide in an aqueous solution containing 1 mole of a zinc salt of an acid, filtering the precipitate and heating the precipitate to dryness at a temperature of about 100° C.

3,996,143

CURED ACRYLATE BEARING MEMBER

Stanley S. Orkin, Rockville, and Edward J. Nagy, Windsor, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Continuation-in-part of Ser. No. 452,359, March 18, 1974, Pat. No. 3,929,396, which is a continuation-in-part of Ser. No. 241,007, April 4, 1972, Pat. No. 3,806,216. This application Oct. 3, 1975, Ser. No. 619,476

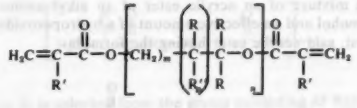
The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² C10M 5/00; F16C 27/00, 1/24

U.S. Cl. 252—12.4 7 Claims

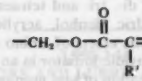
1. A self-lubricating bearing member comprising a bearing surface consisting essentially of a cured mixture of an acrylate composition comprising 30 to 70 percent by weight of said bearing surface, a particulate solid lubricant comprising 8 to 30 percent by weight of said bearing surface and a particulate filler comprising 1–18 percent by weight of said bearing surface, said acrylate composition being selected from the group consisting of

1. a mixture of a compound having the formula

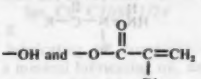


wherein

R is selected from the group consisting of hydrogen, lower alkyl containing 1–4 atoms, hydroxyalkyl containing 1–4 carbon atoms and



R′ is selected from the group consisting of hydrogen, halogen and lower alkyl having 1–4 carbon atoms, R″ is selected from the group consisting of hydrogen, -OH and



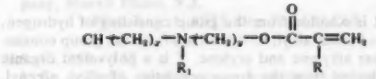
wherein R′ has the meaning given above; *m* is an integer of 1–8; *n* is an integer of 1–20; and *p* is 0 or 1, with a catalytic amount of a hydroperoxide catalyst, characterized (a) by its ability to remain ineffective to polymerize said acrylate in the presence of oxygen at ambient temperature and to initiate polymerization of said monomer in the absence of oxygen at room temperature and (b) its ability to initiate polymerization of said acrylate in the presence of oxygen at a temperature ranging from about 100°–325° F;

2. a mixture of a major amount of a liquid acrylic ester selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, a minor amount of a low molecular weight prepolymer of an ester of a low molecular weight alcohol having a terminal vinyl group and an aromatic polycarboxylic acid in solution in said acrylic ester and an organic amide of the formula

wherein R is selected from the group consisting of hydrogen and aliphatic hydrocarbon of 1–20 carbon atoms in an amount sufficient to copolymerize said acrylic ester and prepolymer;

3. a mixture of acrylic ester monomer, a peroxidic initiator in an amount sufficient to initiate polymerization of said monomer and an aminoalkoxyalkylamine of the formula R_1-N(H)R_2[OR_3]$_x$N(H)R_4 wherein *x* is an integer of 1–6 inclusive, each of R_1 and R_4 is selected from the group consisting of hydrogen and lower alkyl and each of R_2 and R_3 is a lower alkyl linking bridge between N and O, in an amount sufficient to accelerate the polymerization of said monomer;

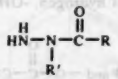
4. a mixture of an acrylic ester of an alkyl amino alkyl alcohol and an effective amount of a hydroperoxide catalyst, said acrylic ester having the formula



wherein *x* is an integer of 0–5 inclusive, *y* is an integer of 1–6 inclusive, R is selected from the group consisting of hydrogen, halogen, hydroxy, cyano and lower alkyl and R_1 is selected from the group consisting of hydrogen and alkyl having 1–6 carbon atoms;

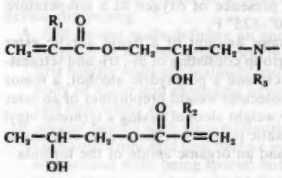
5. a mixture of a liquid acrylic ester monomer selected from the group consisting of diesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator and an oxyalkylamine of the formula $(H)_m N[(CH_2)_x(OR_1)_y OR_2]_n$ wherein *m* and *n* are each integers of 1 to 2 inclusive, the total of *m* and *n* is 3, *x* is an integer of 1 to 6 inclusive, *y* is an integer of 0 to 6 inclusive, R_1 and R_2 are lower alkyl;

6. a mixture of an acrylic ester monomer selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator in an amount sufficient to initiate polymerization of said monomer and a member selected from the group consisting of rhodanine and a hydrazide of the formula



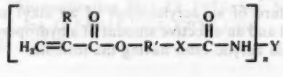
wherein R and R′ are selected from separate groups and an interconnected group forming a cyclic ring, R is further selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and alkoxy and R′ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, acyl and dithiocarbonyl in an amount sufficient to accelerate the polymerization of said monomer;

7. a mixture of a monomer of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of lower alkyl, lower hydroxyalkyl, cyano and lower cyanoalkyl; at least one equivalent of an acid for each equivalent of said monomer, said acid being selected from the group consisting of acrylic acid and lower alkyl acrylic acids; an initiator selected from the group consisting of t-butyl perbenzoate, t-butyl peracetate and di-t-butyl diperphthalate, said initiator being present in an amount sufficient to initiate the polymerization of said monomer; a trihydroxy benzene inhibitor and an accelerator selected from the group consisting of benzhydrazide and N-aminorhodanine, and

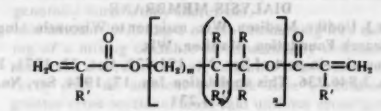
8. a mixture of an acrylate monomer of the formula



wherein R is selected from the group consisting of hydrogen, halogen and lower alkyl, R′ is selected from the group consisting of lower alkylene and arylene, Y is a polyvalent organic radical selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, aralkyl, alkaryl and heterocyclic radicals and *n* is 2–6 inclusive, and a hydroperoxy initiator, present in an amount sufficient to initiate the polymerization of said acrylate monomer.

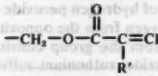
5. A bearing assembly comprising two coengaging members movable relative to one another, the first of said members having a bearing surface selected from the group consisting of metal and ceramic and the bearing surface of the other member consisting essentially of a cured mixture of an acrylate composition comprising 30 to 70 percent by weight thereof, a particulate solid lubricant comprising 8 to 30 percent by weight thereof and a particulate filler comprising 1–18 percent by weight thereof, said acrylate composition being selected from the group consisting of

1. a mixture of a compound having the formula

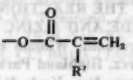


wherein

R is selected from the group consisting of hydrogen, lower alkyl containing 1–4 atoms, hydroxyalkyl containing 1–4 carbon atoms and

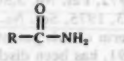


R′ is selected from the group consisting of hydrogen, halogen and lower alkyl having 1–4 carbon atoms, R″ is selected from the group consisting of hydrogen, —OH and



wherein R′ has the meaning given above; *m* is an integer of 1–8; *n* is an integer of 1–20; and *p* is 0 or 1, with a catalytic amount of a hydroperoxide catalyst, characterized (a) by its ability to remain ineffective to polymerize said acrylate in the presence of oxygen at ambient temperature and to initiate polymerization of said monomer in the absence of oxygen at room temperature and (b) its ability to initiate polymerization of said acrylate in the presence of oxygen at a temperature ranging from about 100°–325° F;

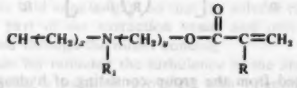
2. a mixture of a major amount of a liquid acrylic ester selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, a minor amount of a low molecular weight prepolymer of an ester of a low molecular weight alcohol having a terminal vinyl group and an aromatic polycarboxylic acid in solution in said acrylic ester and an organic amide of the formula



wherein R is selected from the group consisting of hydrogen and aliphatic hydrocarbon of 1–20 carbon atoms in an amount sufficient to copolymerize said acrylic ester and prepolymer;

3. a mixture of acrylic ester monomer, a peroxidic initiator in an amount sufficient to initiate polymerization of said monomer and an aminoalkoxyalkylamine of the formula $R_1\text{-}N(H)R_2[OR_3]_xN(H)R_4$ wherein *x* is an integer of 1–6 inclusive, each of R_1 and R_4 is selected from the group consisting of hydrogen and lower alkyl and each of R_2 and R_3 is a lower alkyl linking bridge between N and O, in an amount sufficient to accelerate the polymerization of said monomer;

4. a mixture of an acrylic ester of an alkyl amino alkyl alcohol and an effective amount of a hydroperoxide catalyst, said acrylic ester having the formula

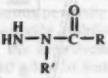


wherein *x* is an integer of 0–5 inclusive, *y* is an integer of 1–6

inclusive, R is selected from the group consisting of hydrogen, halogen, hydroxy, cyano and lower alkyl and R_1 is selected from the group consisting of hydrogen and alkyl having 1–6 carbon atoms;

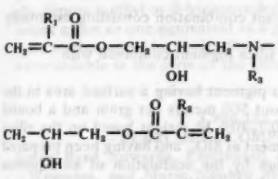
5. a mixture of a liquid acrylic ester monomer selected from the group consisting of diesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic etheralcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator and an oxyalkylamine of the formula $(H)_m N[(CH_2)_x(OR_1)_y OR_2]_n$ wherein m and n are each integers of 1 to 2 inclusive, the total of m and n is 3, x is an integer of 1 to 6 inclusive, y is an integer of 0 to 6 inclusive, R_1 and R_2 are lower alkyl;

6. a mixture of an acrylic ester monomer selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator in an amount sufficient to initiate polymerization of said monomer and a member selected from the group consisting of rhodanine and a hydrazide of the formula



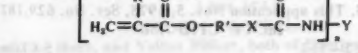
wherein R and R′ are selected from separate groups and an interconnected group forming a cyclic ring, R is further selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and alkoxy and R′ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, acyl and dithiocarbonyl in an amount sufficient to accelerate the polymerization of said monomer; and

7. a mixture of a monomer of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of lower alkyl, lower hydroxyalkyl, cyano and lower cyanoalkyl; at least one equivalent of an acid for each equivalent of said monomer, said acid being selected from the group consisting of acrylic acid and lower alkyl acrylic acids; an initiator selected from the group consisting of t-butyl perbenzoate, t-butyl peracetate and di-t-butyl diperphthalate, said initiator being present in an amount sufficient to initiate the polymerization of said monomer; a trihydroxy benzene inhibitor and an accelerator selected from the group consisting of benzhydrazide and N-aminorhodanine and

8. a mixture of an acrylate monomer of the formula



wherein R is selected from the group consisting of hydrogen, halogen and lower alkyl, R′ is selected from the group consisting of lower alkylene and arylene, Y is a polyvalent organic radical selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, aralkyl, alkaryl and heterocyclic radicals and n is 2–6 inclusive, and a hydroperoxy initiator, present in an amount sufficient to initiate the polymerization of said acrylate monomer.

3,996,144

RUST INHIBITORS AND LUBRICANT COMPOSITIONS CONTAINING SAME

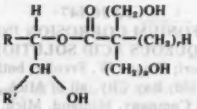
David G. Weetman, Hopewell Junction; Jackson W. Wisner, Jr., Wappingers Falls, and David M. Stehouwer, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,296

Int. Cl.² C10M 1/24

U.S. Cl. 252—56 R **6 Claims**

1. An ashless lubricating oil composition comprising a major portion of a mineral lubricating oil, and a minor, rust-inhibiting, amount of a polyhydric ester represented by the formula:



in which R and R′ are hydrogen or hydrocarbyl radicals having from 1 to 24 carbon atoms; n, m, and r ranges from 0 to 10.

6. A process for lubricating an internal combustion gasoline engine which comprises adding a lubricating oil composition as set forth in claim 1 to the crankcase of said engine and contacting the engine parts including push rods with said composition.

3,996,145

FIBROUS MATERIALS

Stuart Philip Hepburn, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 26, 1973, Ser. No. 419,014

Claims priority, application United Kingdom, Nov. 29, 1972, 55090/72

Int. Cl.² C04B 43/02, 35/48, 35/10

U.S. Cl. 252—62 **7 Claims**

1. A fibrous structure comprising staple fibres comprising polycrystalline alumina, alumina/silica or zirconia, said fibres having an average diameter of 0.5 to 5 microns, not greater than 20 per cent by number of the said fibres having a diameter greater than 5 microns and said fibres having a shot content of less than 5 per cent by weight.

3,996,146

CLEAR SHAMPOO FORMULATION

Arthur Tarasov, Upper Montclair, and Harvey S. Koenig, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 1, 1975, Ser. No. 601,068

Int. Cl.² C11D 10/02, 3/37, 1/90

U.S. Cl. 252—142 **14 Claims**

1. An acid pH, clear shampoo formulation comprising:

1. from about 0.05% to about 2.5% by weight, based on the weight of the total formulation, of a cationic resin selected from the group consisting of:

A. quaternary polymers derived from dimethyl diallyl ammonium salts;

B. polyamide-epichlorhydrin resins derived by reacting adipic acid with diethylene-triamine to form a basic polyamide resin which is further reacted with epichlorhydrin and dimethylamine; and

C. copolymers of acrylamide with beta-methacryloyloxyethyltrimethyl ammonium sulfate containing not more than 5-mole% of beta-methacryloyloxyethyltrimethyl ammonium sulfate;

2. from about 10% to about 25% by weight of at least two anionic detergents selected from the group consisting of:

A. the disodium salt of a half ester of alkanolamide sulfosuccinate;
B. sodium lauryl ether sulfate;
C. sodium N-methyl N-coconut oil acid taurate; and
D. the ammonium salt of a sulfated fatty alkylphenoxypoly (ethyleneoxy) ethanol sulfate;

3. from about 4% to about 15% by weight of at least one amphoteric detergent selected from the group consisting of:
A. an alkyldimethyl betaine;
B. a substituted coco-imidazolinium betaine;
C. a sulfated fatty polyoxyethylene quaternary nitrogen compound; and

4. a sufficient amount of a non-toxic, non-irritating acid to maintain the pH of the shampoo formulation between from about 4.0 to about 6.7.

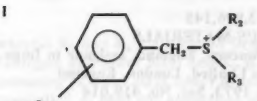
3,996,147
NOVEL SULFONIUM CORROSION INHIBITORS IN AQUEOUS ACID SOLUTIONS

William J. Settineri; Wayne W. Frenier, both of Midland, and James H. Oswald, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 118,174, Feb. 23, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,652
Int. Cl.² C11D 7/00
U.S. Cl. 252—149 **16 Claims**

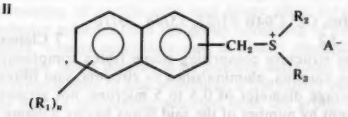
1. An aqueous acidic cleaning solution of at least one non-oxidizing inorganic acid or organic acid or mixtures thereof having dissolved or dispersed therein at least one sulfonium salt corresponding to the formula

I



or

II



wherein n is 1 or 2; R_1 is an electron withdrawing substituent is inert towards the sulfonium moiety and is stable in the aqueous acid cleaning solutions; R_2 is a hydrocarbyl radical of from 1 to about 24 carbon atoms with the provision that R_2 has at least 6 carbon atoms when said sulfonium salt corresponds to I and R_1 is any substituent other than p-nitro; R_3 is an alkyl radical of from 1 to 4 carbon atoms, an inertly-substituted alkyl of 2 to 4 carbon atoms, phenyl or inertly-substituted phenyl; or R_2 and R_3 are joined to form a 5- or 6-membered heterocyclic ring with the sulfonium atom being the sole hetero atom; A^- is a compatible anion; said sulfonium salt being present in an amount at least sufficient to inhibit the acid-induced corrosion of ferrous metals in contact with said solution and ferric ions.

3,996,148
BASIC DETERGENT FOR LIQUID LYES

Pierre Fusey, 8 Rue l'Abbe de l'Epee, Paris Veme, France

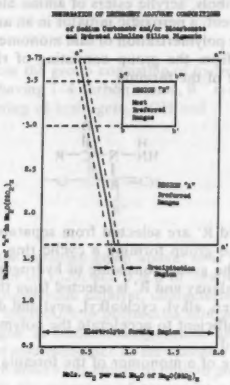
Filed July 25, 1975, Ser. No. 599,163
Claims priority, application France, July 25, 1974, 74.25834
Int. Cl.² C11D 7/06
U.S. Cl. 252—156 **5 Claims**

1. A process for the manufacture of a detergent, comprising reacting a molar excess of a carboxylic C_6–C_9 hydrocarbon diacid without heating with a nitrogen compound selected from the group consisting of C_1–C_4 hydrocarbon amines and C_1–C_4 hydroxy amines, and neutralizing the resulting reaction product with ammonia to bring the pH to 7 to 7.5.

3,996,149
DETERGENT COMPOSITIONS AND DETERGENT ADJUVANT COMBINATIONS THEREOF, AND PROCESSES FOR FORMING THE SAME

Oliver W. Burke, Jr., P.O. Box 2266, Fort Lauderdale, Fla. 33061

Continuation-in-part of Ser. No. 184,059, Sept. 27, 1971, Pat. No. 3,886,079. This application Jan. 2, 1975, Ser. No. 538,209
Int. Cl.² C11D 3/10, 3/14, 7/06, 7/20
U.S. Cl. 252—160 **10 Claims**



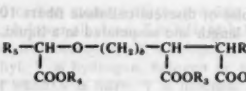
1. A detergent adjuvant combination consisting essentially of:
a. alkaline hydrated silica pigment combined with
b. electrolyte,
c. said alkaline silica pigment having a surface area in the range of 25 to about 500 meters per gram and a bound alkali content of 0.2–40% by weight based on the silica content of the pigment as SiO_2, and having been prepared in aqueous medium by the acidulation of an aqueous solution of water soluble alkali metal silicate and having, prior to drying thereof, been combined with said electrolyte,
d. said electrolyte being from the class consisting of the alkali metal carbonates and bicarbonates and combinations thereof, and being present in an amount in the range of 0.4 to 20 parts of electrolyte per part of silica pigment, as SiO_2, by weight and
e. said combination of said electrolyte and pigment in aqueous medium having been dried.

3,996,150
ESTER COMPOUNDS

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 271,852, July 14, 1972, Pat. No. 3,943,165. This application Nov. 5, 1975, Ser. No. 629,182
Int. Cl.² C11D 7/50
U.S. Cl. 252—162 **5 Claims**

1. A detergent composition comprising from about 5 to about 50 weight percent of a surfactant selected from the group consisting of anionic, nonionic, ampholytic and zwitterionic detergent surfactants and mixtures thereof, from about 10 to about 75 weight percent of a detergent builder and as a detergent solvent from about 1 to about 35 weight percent of a compound having the formula:



wherein R_1 is selected from the group consisting of —H and $-CH_3$; R_2, R_3 and R_4, which may be the same or different substituents, are selected from the group consisting of straight and branched chain alkyl groups having from 1 to 12 carbon atoms, benzyl and cyclohexyl; R_5 is selected from the group consisting of —H, $-CH_3$ and $-C_2H_5$; and b=0,1.

3,996,151

ALKALINE PEROXIDE BLEACH LIQUOR

Uwe Kirner, Bobenheim-Roxheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

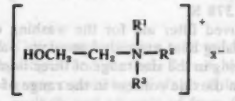
Filed Jan. 26, 1976, Ser. No. 652,388

Claims priority, application Germany, Feb. 18, 1975, 2506799

Int. Cl.² C01B *15/02*

U.S. Cl. 252—186 **2 Claims**

1. In an alkaline aqueous peroxide bleach liquor containing (a) silicate and (b) peroxide stabilizers having a content of alkaline earth metals, the improvement consisting in that it contains about 10 to 50 g/l of at least one quaternary ammonium salt of the formula



in which R^1,R^2 and R^3 are the same or different and individually denote methyl or β-hydroxyethyl and x^- denotes a monovalent anion or one equivalent of a polyvalent anion which is inert to the peroxides under the bleaching conditions and is water-soluble in the form of the above salt.

3,996,152

BLEACHING COMPOSITION

James Byrd Edwards, Cincinnati; Francis Louvaine Diehl, Wyoming, and Mario Stephen Marsan, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 27, 1975, Ser. No. 562,530

Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/02*

U.S. Cl. 252—186 **17 Claims**

1. A fabric bleaching composition, characterized by a viscosity in the range of about 200 centipoise to about 100,000 centipoise, comprising:

a. an effective amount of a solid, substantially water-insoluble peroxygen compound;

b. an amount of a non-starch thickening agent sufficient to impart the desired viscosity to the composition;

c. sufficient acidifying agent to maintaing the pH of the composition in the acidic range until time-of-use; and

d. a liquid carrier.

3,996,153

AEROSOL PROPELLANT

Dieter Heeb, and Volker Böllert, both of Hamburg, Germany, assignors to Hans Schwarzkopf GmbH, Hamburg, Germany

Filed May 22, 1974, Ser. No. 472,581

Claims priority, application Germany, May 26, 1973, 2327067

Int. Cl.² C09K *3/30*

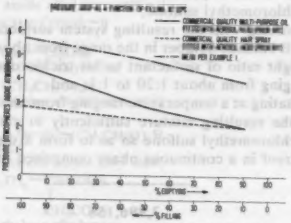
U.S. Cl. 252—305 **3 Claims**

1. A propellant composition which can be sprayed from a compressed gas container, said propellant composition comprising:

a. a solvent mixture comprised of methylene chloride and diethyl carbonate; and

b. carbon dioxide dissolved in said solvent in an amount of about 1 to about 15 weight percent;

wherein said solvent or solvent mixture has a vaporization number of about 1 to about 15 and a gaseous propellant



absorption capacity of about 1 to about 15 weight percent at 20° C.

2. A propellant composition which can be sprayed from a compressed gas container, said propellant composition consisting essentially of:

a. diethyl carbonate; and

b. carbon dioxide dissolved in said solvent

in an amount of about 1 to about 15 weight percent.

3,996,154

EMULSIONS OF ISOCYANATES AND THEIR MANUFACTURE

Frank Johnson; Alan Metcalfe Wooler, both of Manchester, England; Olle Bengtson, Goteborg, Sweden, and Peter Mayrhofer, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 27, 1974, Ser. No. 510,139

Int. Cl.² B01J *13/00;* **B01F** *17/42*

U.S. Cl. 252—312 **7 Claims**

1. An oil-in-water emulsion comprising,

a. from 99 to 25 parts by weight of water;

b. from 1 to 75 parts by weight of an aromatic polyisocyanate; and

c. a stabilizing amount of a non-ionic surface active agent having the formula

$$RO(CH_2CH_2O)_nCONHX$$

wherein R is alkyl containing from 1 to 4 carbon atoms, n is an integer such that the surface active agent contains an average of from 5 to 120 oxyethylene groups and X is the residue of a di- or poly- isocyanate and contains at least one free isocyanate group.

6. Process for the manufacture of the oil-in-water emulsion of claim 1 wherein the non-ionic surface active agent is initially mixed with the organic isocyanate and this mixture is then mixed with the water.

3,996,155

PROCESS FOR MAKING BIS TRICHLOROMETHYL SULFONE EMULSIONS

Manuel Slovinsky, Woodridge; Kenneth G. Phillips, River Forest, and Dodd Wing Fong, Woodridge, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Nov. 11, 1974, Ser. No. 522,950

Int. Cl.² B01J *13/00*

U.S. Cl. 252—312 **11 Claims**

1. A process for making an aqueous liquid emulsion of bis trichloromethyl sulfone comprising the steps of:

a. adding dimethyl sulfide in a liquid phase to an aqueous

liquid phase system containing initially not more than about 22 weight percent total system basis of alkali metal hypochlorite, the addition rate of said dimethyl sulfide being such that the temperature of the resulting liquid phase system is maintained in the range from about 30° to 60° C.

b. maintaining after said adding the resulting liquid phase system at a temperature in the range from about 40° to 105° C for a period of time sufficient to produce bis trichloromethyl sulfone,

c. admixing with the resulting system surfactant having an HLB balance number in the range from about 2 to 40, the weight ratio of surfactant to bis trichloromethyl sulfone ranging from about 1:20 to 1:1, and

d. agitating at a temperature ranging from about 36° to 120° C the resulting mixture sufficiently to emuslify the bis trichloromethyl sulfone so as to form a dispersed phase thereof in a continuous phase comprised of water.

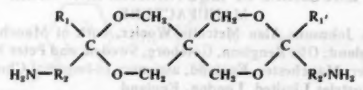
3,996,156
PRODUCTION OF MICROCAPSULES

Hiroharu Matsukawa; Keiso Saeki, and Akio Watanabe, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 28, 1974, Ser. No. 473,981
Claims priority, application Japan, May 28, 1973, 48-59591
Int. Cl.² B01J *13/02*
U.S. Cl. 252—316 **14 Claims**

1. A process for producing externally surrounded microcapsules which comprises bonding

a. a water-soluble or dispersible spiroacetal based heterocyclic diamine represented by the formula:



wherein R_1 and R_1' each represent a hydrogen atom or a lower alkyl group, and R_2 and R_2' each represent a straight or branched chain alkylene group containing 1 to 7 carbon atoms; or an addition product thereof selected from the group consisting of a reaction product of the said heterocyclic diamine with a compound containing at least one oxirane group in the molecule, acrylonitrile, urea, thiourea, or guanidine; to

b. an organic compound selected from the group consisting of an aldehyde, an epoxy compound, an alkyl halide, an acid anhydride, a polyhalohydrin and a polybasic acid chloride: the proportion of component (b) to (a) being from about 1/30 to 30 times by weight, in a polar solvent containing dispersed particles or droplets of a hydrophobic material to form a compound which is insoluble in said polar solvent and depositing said insoluble compound from said polar solvent directly on the surface of said particles or droplets of a hydrophobic material to encapsulate said hydrophobic material.

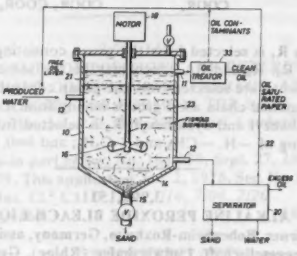
3,996,157
METHOD FOR CONTINUOUSLY SEPARATING EMULSIONS

John A. Herce, Bellaire, and James E. Heath, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 271,441, July 13, 1972, Pat. No. 3,869,408. This application July 18, 1974, Ser. No. 489,678
Int. Cl.² B01D *15/02*
U.S. Cl. 252—325 **28 Claims**

1. A method for separating the phases of a liquid-liquid emulsion having a continuous phase and a disperse phase comprising the steps of:

contacting the emulsion in a contacting zone with a non-granular solid of discrete cellulose fibers 100 to 10,000 microns in length and suspended in a liquid; and



separately withdrawing continuous phase and substantially fibrous-solid free disperse phase from the contacting zone.

3,996,158
PUMICITE FILTER AID

Marvin D. Cohen, 9251 Burdine, No. 297, Houston, Tex. 77016

Filed Sept. 23, 1974, Ser. No. 508,164
Int. Cl.² C04B *31/22, 31/26;* B01J *29/10*
U.S. Cl. 252—378 R **10 Claims**

1. An improved filter aid for the washing of drycleaning solvent comprising heat expanded pumicite particulates, said particulates being in the size range of three hundred mesh and having a silicon dioxide content in the range of eighty percent or more.

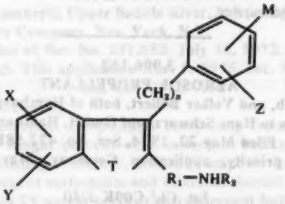
8. An improved filter aid for the washing of dry cleaning solvent comprising heat expanded pumicite particulates, said particulates being in the size range of 300 mesh and having a silicon dioxide content in the range of eighty percent or more, the head expansion occurring upon exposure to an atmospheric temperature in the range of 2700° F.

3,996,159
ANTIMICROBIAL COMPOSITIONS

Martin Steinman, Livingston, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 473,625, May 28, 1974, Pat. No. 3,944,672, which is a continuation-in-part of Ser. No. 314,899, Dec. 13, 1972, abandoned. This application Dec. 1, 1975, Ser. No. 636,517
Claims priority, application United Kingdom, Dec. 3, 1973, 55819/73
Int. Cl.² A61K *31/40*
U.S. Cl. 252—401 **3 Claims**

1. A method for preserving a compound from microbial contamination, which comprises incorporating, in a composition in which preservation is desired, about 0.1 to 0.5% by weight of a compound of the formula:



wherein r is 0 or 1; R_2 is hydrogen, or lower amino alkylene having 1 to 3 carbon atoms; R_1 is carbonyl or lower alkylene

having 1 to 3 carbon atoms with the provisio that when R_2 is hydrogen, R_1 is lower alkylene; T is NH; M is hydrogen, halogen, methyl or trifluoromethyl; X is halogen, nitro, methoxy or trifluoromethyl; Y is hydrogen, halogen or methyl with the provisio that when X is nitro, Y is halogen; Z is hydrogen, halogen, nitro or methyl; and the non-toxic acid addition salts thereof.

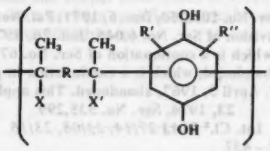
3,996,160

HYDROQUINONOID ORTHO-ALKYLATION POLYMERS AND THE PROCESS OF THEIR PRODUCTION

James A. Dale, Menlo Park, and Patricia C. Wang, Palo Alto, both of Calif., assignors to Dynapol Corporation, Palo Alto, Calif.

Filed Feb. 24, 1975, Ser. No. 552,017
Int. Cl.² C09K 15/08; C08F 12/24
U.S. Cl. 252—404 **24 Claims**

1. A polymer comprising from about 3 to about 100 recurring hydroquinonoid structural units of the formula



wherein X and X′ independently are selected from the group consisting of hydrogen and methyl, R is a hydrocarbon selected from the group consisting of alkyls of from 1 to 6 carbons and aryls, aralkyls and alkaryls of from 6 to 14 carbon atoms and R′ and R″ independently are selected from the group consisting of hydrogen, lower alkyls of from 1 to 6 carbon atoms, and aralkyls of from 8 to 12 carbon atoms.

3,996,161

ACTIVE CARBON AND A METHOD OF PREPARING THE SAME

Tung-Yu Chia, 32-50, 70th St., Apt. 5J, East Elmhurst, N.Y. 11370

Filed Nov. 26, 1974, Ser. No. 527,272
Claims priority, application Japan, Mar. 5, 1974, 49-24851
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.² B01J 31/02
U.S. Cl. 252—428 **8 Claims**

1. A method of preparing active carbon for treatment of waste liquid comprising immersing powdered coal into an aqueous solution of a polar compound containing a non-polar group bonded to a polar group, and then washing the immersed coal followed by drying of said washed coal; said aqueous solution containing between about 0.01% and 1% by weight of said polar compound, and said powdered coal being in a weight ratio to said aqueous solution of between 1:3 and 1:5; and said polar compound being selected from the group consisting of:

(a) alkyl sulfate
$R—SO_3M$

(b) alkyl sulfonate
i) $R—SO_3M$
ii) $R—\underset{\displaystyle SO_3M}{\underset{|}{CH}}—R$

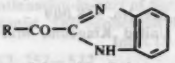
(c) α-sulfonated fatty acid
$R—\underset{\displaystyle SO_3H}{\underset{|}{CH}}—COOH$

(d) dialkyl succinate

-continued

$R—O\,.\,OC—\underset{\displaystyle SO_3M}{\underset{|}{CH_2—CH}}—COOR$

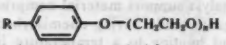
(e) fatty acid benzimidazoline



(f) succinic amide alkyl ester sulfonate
$MO_3S—\underset{\displaystyle CH_2—COOM}{\underset{|}{CH}}—CONH—R$

(g) polyoxyethylene alkyl ether
$R—O—(CH_2CH_2O)_nH$

(h) polyoxyethylene alkylphenol ether



(i) polyoxyethylene polyol fatty ester
$(CH_2CH_2O)_n—\underset{\displaystyle CH_2COOR}{\underset{|}{CHCOOR}}$

(j) polyoxyethylene alkylamine
$(CH_2CH_2O)_nH$
RN
$(CH_2CH_2O)_nH$

(k) alkylpyridinium halide

(l) alkyl phosphate
$R\,.\,OPO(OM)_2$

(m) alkylaryl phosphate

wherein R and R′ are alkyl groups having between about 10 and 20 carbon atoms, M is selected from the group consisting of NH_4 and alkali metals, X is a halogen and *n* is an integer from 1 to about 10.

3,996,162

ANALYTICAL SORBENT AND METHOD OF USE

Mary S. McCall, Dallas, Tex., assignor to Nuclear Medical Laboratories, Inc., Dallas, Tex.

Continuation of Ser. No. 15,216, Feb. 27, 1970, abandoned.
This application Mar. 1, 1974, Ser. No. 447,217
Int. Cl.² G01N 33/16
U.S. Cl. 252—430 **13 Claims**

1. A method of preparing an analytical sorbent for an in vitro diagnostic test which has a stabilized sorbent capacity for endogenous material found in a body fluid selected from the group consisting of protein-type constituents and metals comprising:

a. wetting a particular inorganic crystalline lattice material with an aqueous buffer solution, said particulate inorganic crystalline lattice material being selected from the group consisting of carbonates, phosphates, oxides, hydroxides, silicates, aluminates, and sulfates of the metallic elements in Groups IA, IIA, IIIA, IIB and VIII of the Periodic Table and mixed salts thereof; and

b. heating the resulting dispersion at a temperature of from about 25° C to the boiling point of said aqueous buffer solution for a sufficient time to cause the sorbent capacity of said material to stabilize.

3,996,163

POLYMERIZATION CATALYST

Ronald Alfred Crump, Horsham; Brian Peter Forsyth Goldie, Cheam, and Prem Sagar Thukral, Kenley, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 13, 1975, Ser. No. 558,009

Claims priority, application United Kingdom, Mar. 22, 1974, 12793/74

Int. Cl.² B01J *31/02*

U.S. Cl. 252—430 **10 Claims**

1. In a process for preparing a polymerization catalyst containing titanium and chromium on a difficulty reducible organic solid said catalyst being suitable for polymerising 1-olefins the improvement which comprises (1) adding a first titanium compound to a catalyst support material comprising a difficulty reducible inorganic oxide having chemisorbed surface hydroxyl groups and heating to a temperature in the range 150° to 1,200° C, (2) retreating with titanium by carrying out the following steps (a) and (b) one or more times: (a) reforming some hydroxyl groups on the surface of the titanium-treated support material and (b) adding a second titanium compound to the support material and heating at a temperature in the range 150° to 1,200° C to form a catalyst precursor, (3) incorporating in the catalyst precursor under substantially anhydrous conditions a chromium compound and heating at a temperature in the range 100°–1200° C to produce an active polymerization catalyst.

3,996,164

CATALYSTS FOR HYDROFORMYLATION AND HYDROESTERIFICATION AND METHOD FOR MANUFACTURE THEREOF

Akio Matsuda, Kashiwa, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 418,107, Nov. 21, 1973, abandoned. This application June 20, 1975, Ser. No. 588,874

Claims priority, application Japan, Nov. 25, 1972, 47-118235

Int. Cl.² B01J *31/18, 31/20*

U.S. Cl. 252—431 N **7 Claims**

1. A process for the manufacture of a catalyst for use in hydroformylation and hydroesterification of olefins at low temperature and pressure, comprising the steps of:

A. mixing cobalt carbonyl with at least one member selected from the group consisting of pyridine, alkylpyridine, formylalkylpyridine and vinylpyridine, and a hydrocarbon solvent at a weight ratio of 1 : (1 – 10) ; (4 – 30);

B. compressing the mixture to 10 – 200 kg/cm² of pressure of carbon monoxide and simultaneously heating the mixture to 80° – 200° C to produce a complex in the mixture;

C. cooling the resultant reaction product to room temperature thereby producing a phase essentially comprising said hydrocarbon solvent and a phase essentially comprising said complex; and

D. separating the phase essentially comprising the complex from the cooled reaction product.

3,996,165

PROCESS FOR PREPARING PLATINUM METAL CATALYSTS

Hussain El-Ghatta, Chur, Grisons, and Johann Karl Forrer, Domat-Ems, Grisons, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Dec. 24, 1974, Ser. No. 536,186

Claims priority, application Switzerland, Jan. 14, 1974, 443/74

Int. Cl.² B01J *27/02*

U.S. Cl. 252—436 **7 Claims**

1. A process for preparing an improved platinum metal catalyst which comprises contacting a platinum catalyst having a support selected from the group consisting of activated charcoal and graphite, with

a. a sulfur-containing compound containing 1–15 atom % sulfur based on the weight of the platinum metal which liberates sulfurous acid under acidic conditions, and

b. a hydroxylammonium salt having a concentration of 1–5N,

at a temperature of 15–100° C., the process being conducted in an acid medium and substantially in the absence of oxidizing agents capable of oxidizing sulfurous acid to form sulfate.

3,996,166

CATALYSTS FOR CONVERSION OF OLEFINS

Robert L. Banks, and Joseph R. Kenton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 205,350, Dec. 6, 1971, Pat. No. 3,865,751, which is a division of Ser. No. 6,045, Jan. 26, 1970, Pat. No. 3,660,506, which is a continuation of Ser. No. 678,499, Oct. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 627,668, April 3, 1967, abandoned. This application Dec. 23, 1974, Ser. No. 535,299

Int. Cl.² B01J *27/14, 23/08, 23/16*

U.S. Cl. 252—437 **4 Claims**

1. A composition active for converting an olefin to obtain the product of the olefin reaction which, as defined herein, can be visualized as comprising the reaction between two first pairs of carbon atoms, the two carbon atoms of each first pair being connected by an olefinic double bond, to form two new pairs from the carbon atoms of said first pairs, the two carbon atoms of each of said new pairs being connected by an olefinic double bond comprising magnesium oxide admixed with a separate disproportionation catalyst selected from the group consisting of

alumina promoted by an oxide or compound convertible to an oxide by calcination of molybdenum, tungsten or rhenium; a sulfide of tungsten or molybdenum; or an alkali metal salt, ammonium salt, alkaline earth metal salt, or bismuth salt of phosphomolybdic acid;

said magnesium oxide being present in an amount in the range of 0.1 to 20 parts by weight per part by weight of said disproportionation catalyst.

2. The composition of claim 1 wherein said disproportionation catalyst comprises molybdenum oxide on alumina.

3,996,167

ANTISTATIC SURFACES

Peter Thomas Brown, Newmarket, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,124

Claims priority, application United Kingdom, Nov. 9, 1973, 52019/73

Int. Cl.² H01B *1/02;* **H01C** *1/02*

U.S. Cl. 252—513 **11 Claims**

1. An electrically conductive composition comprising a curable synthetic resin and at least 1 g and at most 20 g, per liter of total composition, of metal fibers of niobium, nickel, tungsten, iron, aluminum, carbon steel, chrome-nickel or stainless steel, substantially all the said fibers having a length of at least 1.5 mm and at most 10 mm and an average diameter of at least 8 μm and at most 15 μm.

3,996,168
CERAMIC ELECTRICAL RESISTOR

Günther Hoffmann, Munich, and Helmut Schmelz, Prien, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 4, 1974, Ser. No. 439,569
Claims priority, application Germany, Feb. 19, 1973, 2308073
Int. Cl.² H01B 1/06
U.S. Cl. 252—520 21 Claims

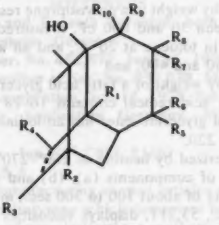
1. A ceramic electrical resistor having a positive temperature-resistance coefficient and comprising barium titanate having an atomic excess of titanium, said resistor having a ferroelectric perowskite structure, said resistor being conductive by the presence therein of a rare earth dopant in an amount of from 0.4 to 1.2 atomic percent, said resistor also containing at least one of the following elements in the amounts indicated: cobalt from 0.1 to 0.5 atomic percent, chromium from 0.005 to 0.2 atomic percent, nickel in an amount of about 0.1 atomic percent, vanadium in an amount of about 0.04 atomic percent, manganese from 0.08 to 0.12 atomic percent and copper from 0.005 to 0.020 atomic percent, said resistor having a specific electrical resistance at 25° C of about 15 to 300 ohm-cm.

3,996,169
PERFUME USES OF TRICYCLIC ALCOHOLS AND PROCESSES

Kenneth K. Light, Long Branch, N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, and Manfred Hugo Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 436,848, Jan. 28, 1974, Pat. No. 3,907,908. This application Sept. 17, 1975, Ser. No. 614,078
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 8 Claims

1. A fragrance modifying composition comprising a tricyclic compound having the structure:

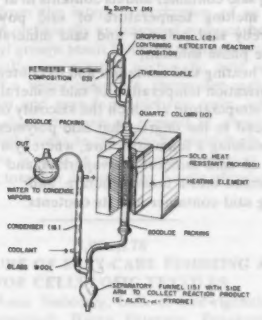


wherein each of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} is selected from the group consisting of hydrogen and methyl; wherein the dashed line is a carbon-carbon single bond or a carbon-carbon double bond; wherein R_1 is limited to hydrogen when (i) the dashed line is a carbon-carbon single bond, (ii) R_2, R_3, R_4, R_6, R_7, R_8, R_9 and R_{10} is hydrogen and (iii) R_5 is hydrogen or methyl; and wherein when the dashed line is a carbon-carbon single bond, one of R_3 or R_4 is hydrogen, and an auxiliary perfume ingredient.

3,996,170
6-n-BUTYL ALPHA PYRONE PERFUMES

Edward J. Shuster, Brooklyn, N.Y., and Alan Owen Pittet, Atlantic Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 471,755, May 20, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,081
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 5 Claims



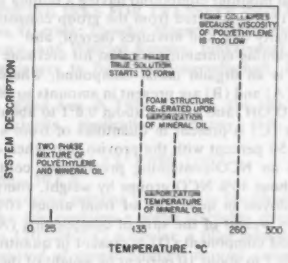
1. A process for preparing a perfume composition comprising the step of admixing (i) a composition of matter in the liquid phase which composition of matter has an aroma impression which is capable of being modified so that it will include one or more sweet, coumarin-like, herbal, floral, green, lovage, celery, tagette and/or foenugreek notes with (ii) from about 0.4 up to 50% by weight of said composition of a synthetically produced, substantially pure 6-alkyl-alpha-pyrone, being selected from the group consisting of:

4-methyl-6-n-butyl-alpha-pyrone; and 6-n-butyl-alpha-pyrone.

3,996,171
POLYMERIC FOAM AND METHOD FOR MAKING THE SAME

Ray W. Holland, and John F. Fellers, both of Knoxville, Tenn., assignors to Tennessee Applied Plastics, Inc., Knoxville, Tenn.

Filed Aug. 11, 1975, Ser. No. 603,352
Int. Cl.² C08J 9/28
U.S. Cl. 260—2.5 HA 4 Claims



1. A process for the manufacture of polyethylene or polypropylene foam comprising the steps of

admixing a quantity of powdered polymer consisting essen-

tially of polyethylene or polypropylene with a quantity of a blowing agent consisting essentially of mineral oil at ambient conditions to produce a two-phase mixture of said polymer and said mineral oil in which said mineral oil is substantially uniformly distributed in said powdered polymer, said mineral oil having a vaporization temperature above the crystaline melting temperature of the polymer but not greater than about 125° C,

introducing said mixture into a container and closing said container sufficiently to prevent the escape of said mixture but less than gas-tight,

heating said container and its contents to at least the crystalline melting temperature of said powdered polymer whereby said polymer and said mineral form in situ a single phase solution,

further heating said container and its contents at least to the vaporization temperature of said mineral oil but less than that temperature at which the viscosity of said polymer is reduced to the degree that said polymer is incapable of maintaining a foam structure, whereby a substantial portion of said mineral oil vaporizes and said polymer is expanded into a foam structure, and

cooling said container and its contents.

3,996,172

NON-ELASTOMERIC POLYURETHANE COMPOSITIONS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,489

Int. Cl.² C08G *18/48*

U.S. Cl. 260—18 TN **25 Claims**

1. A non-elastomeric, non-cellular, solid polymer having a density of at least about 1 gram/cc and a percent elongation less than 80 resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230;

B. an organic polyisocyanate,

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of fatty acids, fatty oils, and mixtures thereof, and

D. a non-amine-containing catalyst for urethane formation, which is an organo metal compound; wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1; component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when component (B) is an NCO-containing prepolymer containing less than about 40% NCO groups by weight, component (C) is employed in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,996,173

IMPACT RESISTANT THERMOPLASTIC PVC MOLDING COMPOSITION

Friedrich Heichele; Johann Bauer, both of Burghausen, and Helmut Wimmer, Winhoring, all of Germany, assignors to Wacker-Chemie GmbH, Burghausen, Germany

Filed Sept. 23, 1974, Ser. No. 508,196

Claims priority, application Germany, Sept. 25, 1973, 2348177

Int. Cl. C08l *91/00*

U.S. Cl. 260—23 XA **8 Claims**

1. An impact resistant thermoplastic molding composition consisting essentially of

A. from 80 to 98% by weight of a vinyl chloride polymer derived from monomers selected from the group consisting of (a) from 90 to 100% by weight of vinyl chloride and (b) from 0 to 10% by weight of a monomer copolymerizable with vinyl chloride, and

B. from 2 to 20% by weight of a modifying resin for increasing the impact resistance, having a further content of

C. from 2 to 30% by weight, based upon the weight of said vinyl chloride polymer, of a coated calcium carbonate powder, the surface of said powder coated with stearic acid, and said powder having a particle size of 0.04 to 0.1 μ, and

D. from 0 to 10% by weight, based upon the weight of said vinyl chloride polymer of a conventional molding composition additive ingredient.

3,996,174

PROCESS FOR THE MANUFACTURE OF HEAT-CURABLE SYNTHETIC RESINS WHICH CAN BE DILUTED WITH WATER AND ARE SUITABLE FOR THE ELECTROPHORETIC COATING PROCESS

Bernhard Broecker, Hamburg, and Richard Schardt, Oststeinbek, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 15, 1974, Ser. No. 469,955

Claims priority, application Germany, Mar. 9, 1974, 2411368

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 A **15 Claims**

1. Process for the manufacture of a heat-curable synthetic resin, based on a reaction product of maleic anhydride with a mixture of polybutadiene, unsaturated hydrocarbon resin and an unsaturated fatty acid glyceride ester, which can be diluted with water and is suitable for the electrophoretic coating process wherein a mixture consisting of:

a. 20–60% by weight of a polybutadiene having an average molecular weight of 750–2,000 and an iodine number between 300 and 450,

b. 10–60% by weight of a polyisoprene resin having a viscosity between 30 and 800 cP, measured in 70% strength solution in toluene at 20° C, and an iodine number between 160 and 400, and

c. 5–40% by weight of a fatty acid glyceride ester, wherein the fatty acid radical contains 16–18 C atoms and the fatty acid glyceride ester has an iodine number between 140 and 220,

is pre-polymerized by heating to 200°–270° C until the reaction mixture of components (a), (b) and (c), which has an initial viscosity of about 100 to 300 sec., measured according to DIN 4 sec., 53,211, displays viscosities between 400 and 2,000 sec., measured according to DIN 4 sec., 53,211, the resulting mixture is then reacted with

d. 10–20% by weight of maleic anhydride at 180°–190° C until no further free maleic anhydride is present, and

e. in the resulting adduct the anhydride groups present are opened by hydrolysis with water or by alcoholysis with the amount of C_1 to C_4 of monohydric alcohols required to form the half-ester,

characterized in that the reaction is carried out to modify the process product by co-using as component (f), 5 to 25% by

weight, relative to the total weight of the components (a), (b), (c) and (d), of an adduct of an α,β-unsaturated aliphatic dicarboxylic acid to a resin acid or an adduct which is partially or completely esterified with a polyhydric saturated aliphatic alcohol.

3,996,175

STORAGE-STABLE, QUICK-CURING EPOXIDE RESIN MOULDING MATERIALS

Bruno Schreiber, Basel; Wolfgang Seiz, Pfeffingen, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 257,799, May 30, 1972, abandoned. This application July 17, 1974, Ser. No. 489,331

Claims priority, application Switzerland, June 25, 1971, 9351/71

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C08L 91/00

U.S. Cl. 260—28 P **14 Claims**

1. Storage-stable, one package quick-curing resin moulding materials consisting essentially of:

a. epoxide resin consisting essentially of an adduct containing free epoxide groups and formed from a low molecular weight epoxide resin and a polyamine,

b. pre-adducts containing free amino groups and formed from polyamines containing aromatic groups and a diepoxide, as curing agents, wherein the ratio of the number of the reactive hydrogen atoms of the polyamine on the amine nitrogen atoms to that of the epoxide groups of the epoxide is in the range of 3;1 to 5:1, and

c. mineral or organic pulverulent or fibrous fillers, with the epoxide resins and the curing agents softening between 45° and 120°C, and having a melting point higher by 5° to 30°C than the softening point, and the epoxide resins and curing agents being present in the moulding materials predominantly as discrete particles.

3,996,176

METHOD OF MANUFACTURING SHAPED MEMBERS OF SYNTHETIC THERMOPLASTIC MATERIALS FREE OF SOFTENERS

Zareh Lorenian, and Eugenia Lorenian, both of Friedrichsplatz 16, Mannheim, Germany

Continuation of Ser. No. 482,877, June 25, 1974, abandoned, which is a continuation of Ser. No. 339,030, March 7, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,384

Claims priority, application Germany, Mar. 8, 1972, 2210992

Int. Cl.² C08L 91/00

U.S. Cl. 260—28.5 A **3 Claims**

1. Method of manufacturing shaped articles such as round rods or plates of polystyrene which comprises intimately mixing in the absence of any plasticizer, a synthetic thermoplastic material consisting essentially of impact-resistant polystyrene, with natural hard wax in the proportion of two to eight parts by weight of said polystyrene to at least two to four parts by weight of said wax, said proportion in each case having a higher proportion of said polystyrene than the proportion of said wax in dry state with said wax constituting at least 25% by weight of said polystyrene, and subsequently shaping the mixture at a temperature of 130° to 220° C by extrusion, injection molding or blow molding into said shaped article.

3,996,177

STABLE ACRYLIC ESTER LATEX COATING COMPOSITIONS

Robert U. Ludwig, Lorain, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 18, 1975, Ser. No. 550,369

Int. Cl.² C08L 61/20

U.S. Cl. 260—29.4 UA **9 Claims**

1. A stable latex coating composition comprising (1) an acrylic ester polymer latex wherein the polymer having cure sites selected from the group consisting of hydroxy, carboxyl and mixtures thereof on the polymer where the hydroxyl groups result from the interpolymerization of an N-alkylol amide of an α,β-olefinically unsaturated monocarboxylic acid and the carboxyl groups result from the interpolymerization of an α,β-olefinically unsaturated carboxylic acid and (2) a combination of a water-reducible, thermoset melamine-formaldehyde resin and urea-formaldehyde resin, wherein the melamine-formaldehyde resin is present in about a 1:1 to about a 4:1 weight ratio to the urea-formaldehyde resin and the combination is used in from about 5 parts to about 30 parts by weight total per 100 parts by weight of polymer in the latex.

3,996,178

MANUFACTURE OF EASY-CARE FINISHING AGENTS FOR CELLULOSIC TEXTILES

Kurt Fischer; Anna Steimmig, both of Ludwigshafen; Heinz Bille, Limburgerhof; Harro Petersen, Frankenthal, and Herbert Tulo, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 4, 1975, Ser. No. 628,799

Claims priority, application Germany, Nov. 9, 1974, 2453250

Int. Cl.² C08G 51/58, 9/30

U.S. Cl. 260—29.4 R **1 Claim**

1. A process for the manufacture of stable, highly reactive, liquid easy-care finishing agents for cellulosic textiles, the agents being based on urea, formaldehyde and glyoxal, wherein, in a first process stage, one mole of urea is heated with from 4 to 8 moles of formaldehyde in aqueous solution at a pH of from 3 to 0 for from one minute to 4 hours at from 60° to 100° C, a second stage, a primary aliphatic saturated amine of 1 to 5 carbon atoms is added at from 30° to 90° C, without significant prior change of the pH, and, after a further 2 to 120 minutes, in a third stage in the same temperature range and at a pH of from 6 to 7.5, further urea is added followed, after a further 2 to 120 minutes in the same temperature range and pH range, by the additional of glyoxal, the amounts being such that the overall molar ratio of urea : formaldehyde : glyoxal : amine is 1 : from 1.5 to 3 : from 0.1 to 0.5 : from 0.03 to 0.5, after which the entire mixture is heated for from 15 minutes to 10 hours at from 30° to 90° C.

3,996,179

PRINTING INKS FOR TRANSFER PRINTING

Artur Haus, Overath; Theodor Mager; Norbert Pusch, both of Leverkusen, and Wilfried Roseler, Junkersdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 9, 1974, Ser. No. 496,181

Claims priority, application Germany, Oct. 18, 1973, 2352246

Int. Cl.² C09D 11/02

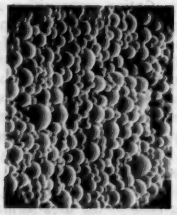
U.S. Cl. 260—29.6 R **2 Claims**

1. In an aqueous printing ink suitable for transfer printing wherein the ink contains a water-insoluble dyestuff which sublimes at 120°–280° C; a binder; a filler selected from the group consisting of quartz powder, natural calcium magnesium carbonate, and mixtures of the two; a thickener; an organic solvent; and a surface active agent; the improvement which comprises having the binder/filler weight ratio in the ink from 1:6 to 1:7.

3,996,180
HIGH SHEAR MIXING OF LATEX POLYMERS

James Kane, Park Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 23, 1975, Ser. No. 570,988
Int. Cl.² C08L 33/02
U.S. Cl. 260—29.6 H 4 Claims



1. An improvement in a method for producing a polymeric latex of the type comprising a water-in-oil emulsion which contains dispersed therein a finely divided water soluble vinyl addition polymer, said polymeric latex being produced by the known steps of:

A. Forming a water-in-oil emulsion from:

1. water which contains therein a water soluble ethylenically unsaturated monomer, thereby producing a monomer phase which has a concentration of from 30 – 95% by weight of the emulsion;
2. a hydrophobic liquid in a concentration of from 5–70% by weight of the emulsion;
3. a water-in-oil emulsifying agent in a concentration of from 0.1–21.0% by weight of the emulsion;
4. a free radical initiator;

B. Subjecting said emulsion to free radical forming conditions so as to polymerize the water soluble ethylenically unsaturated monomer contained in the emulsion; and then,

C. Recovering the water-in-oil emulsion of the water soluble vinyl addition polymer; the improvement which comprises subjecting the water-in-oil emulsion of the water soluble ethylenically unsaturated monomer to high shear mixing prior to polymerization said shear not being so great as to break the emulsion or to cause the emulsion to set up in a paste or gell-like consistency, whereby the water-in-oil emulsion of the water soluble vinyl addition polymer of Step C has improved storage stability.

3,996,181
AQUEOUS COMPOSITION CONTAINING ACRYLIC OR BUTADIENE POLYMERS

Toshio Hayashi, Hirakata, and Tetsuo Moriya, Osaka, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1975, Ser. No. 579,046
Claims priority, application Japan, May 25, 1974, 49-59035
Int. Cl.² C08L 33/02
U.S. Cl. 260—29.6 RW 6 Claims

1. An aqueous resinous composition consisting essentially of (1) an aqueous emulsion of acrylic polymer, which is prepared by emulsion-polymerizing at least one acrylic monomer selected from the group consisting of an acrylic acid ester, acrylic acid, acrylamide, N-methylolacrylamide, a methacrylic acid ester, methacrylic acid, methacrylamide and N-methylolmethacrylamide, or an aqueous emulsion of a butadiene polymer which is prepared by emulsion-copolymerizing a butadiene monomer with at least one monomer selected from the group consisting of styrene, an acrylic acid ester, acrylic acid, acrylonitrile, acrylamide, a methacrylic acid ester, methacrylic acid, methacrylonitrile and methacrylamide in an aqueous medium in the presence of a hydrolyzed vinyl acetate-alkali metal olefin-sulfonate copolymer containing 0.5 to 7% by mole of an alkali metal olefinsulfonate unit and having a degree of hydrolysis in the vinyl acetate unit of at least 65% by mole as an emulsifier to form a first emulsion, and (2) a water-soluble polymeric material which is admixed with the first emulsion; the weight ratio of the solid content of said first emulsion to said polymeric material falling within the range of 1 : 9 to 9 : 1.

3,996,182
WATER-BASED CAN COATING COMPOSITION AND METHOD OF MAKING SAME

Myung K. Hong; Edward J. Holzrichter, both of Riverside, and Edward A. Lasher, Beverly Hills, all of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed June 12, 1975, Ser. No. 586,785
Int. Cl.² C08K 5/06, 5/07, 5/10; C08L 63/00
U.S. Cl. 260—29.6 NR 34 Claims

1. A water-soluble concentrate suitable for the formulation, with water, of a heat-curable, film-forming composition, said concentrate comprising:

a low molecular weight ester compound having a maximum molecular weight of about 700 and being reducible with water at pH 7 to at least about 80% by weight of nonvolatile material, said ester compound being the condensation product of (a) at least one polycarboxylic acid having 2–3 carboxyl groups, and anhydrides thereof with (b) at least one polyol having 2–4 hydroxyl groups and having 2 to about 7 carbon atoms, said polycarboxylic acid and said polyol being present in a molar ratio sufficient to provide at least about a 100% excess of said hydroxyl groups over said carboxyl groups;

a heat-reversible, water-soluble, epoxy amine salt consisting essentially of the reaction product of

i. an aliphatic amine having a boiling point less than the temperature used to cure said film-forming composition, said amine being present in said concentrate in amount sufficient to provide said film-forming composition with an alkaline pH which will not substantially retard cure of said film-forming composition, and

ii. a modified epoxy resin having pendant carboxyl groups attached thereto, said modified epoxy resin being the half-ester reaction product made by the heating of a saturated dicarboxylic acid anhydride with an epoxy resin partial ester at a temperature less than that temperature at which the pendant carboxylic acid generated reacts with said epoxy resin partial esters, said saturated dicarboxylic acid anhydride being present in an amount with respect to said epoxy resin partial ester to provide said modified epoxy resin with an acid number between about 40 and about 70, said epoxy resin partial ester being the reaction product obtained by the heating of a monocarboxylic acid with a low molecular weight bisphenol/epichlorohydrin epoxy resin at a temperature sufficient to minimize polymerization of said epoxy resin with itself and to promote the reaction of said monocarboxylic acid with said epoxy resin, said monocarboxylic acid being used in at least about a stoichiometric amount with respect to said epoxy resin;

a cross-linking agent reactive with hydroxyl groups for reaction with said ester compound and with said modified epoxy resin to provide a densely cross-linked cured coating, said cross-linking agent having from 4–6 reactive sites per molecule and being a material selected from the group consisting of melamines and ureas having pendant alkoxy and alkylol substituents available for reaction with said hydroxyls, said alkoxy and alkylol substituents having from 1–4 carbons; and

an organic coupling solvent for coupling said modified epoxy resin with said water, said coupling solvent having a boiling point such that it remains in the film during cure until after substantially all of the water has been evaporated therefrom, said coupling solvent being present in an

amount sufficient to provide a stable water/coupling solvent system to produce continuous cured films;

with the weight ratio of said ester compound/modified epoxy resin/cross-linking agent being between about 2:1:0.5–0.3 and about 1:2:0.5–0.3, respectively.

3,996,183

SOLID PASTE AND METHOD OF MAKING SAME

Shiro Torii, Tokyo, Japan, assignor to Ogawa Chemical Industries, Ltd., Japan

Continuation of Ser. No. 434,409, Jan. 18, 1974, abandoned, Continuation-in-part of Ser. No. 264,826, June 21, 1972, abandoned. This application Oct. 3, 1975, Ser. No. 619,458
Claims priority, application Japan, Feb. 21, 1972, 47-17951
Int. Cl.² C08L 29/04, 39/06
U.S. Cl. 260—29.6 HN 11 Claims

1. Solid paste composition which consisting essentially from about 10 to about 40 parts by weight of a paste component miscible with water consisting essentially of a member selected from the group consisting of polyvinyl alcohol, and copolymer of a water dispersive about 40%, vinyl acetate and about 60% vinylpyrrolidone; from about 35 to about 70 parts by weight of a solvent component consisting essentially of lower alkanol; from about 1 to about 10 parts by weight of a gel forming agent consisting essentially of a condensate of sorbite and benzaldehyde; and from about 2 to about 15 parts be weight of a solution accelerator consisting essentially of alkylpyrrolidone for said gel forming agent.

3,996,184

LOW MODULUS ROOM TEMPERATURE VULCANIZABLE SILICONE ELASTOMER WITH IMPROVED SLUMP CHARACTERISTICS

Jerome M. Klosowski, Monitor Township, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

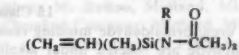
Filed Dec. 8, 1975, Ser. No. 638,576
Int. Cl.² C08K 5/20
U.S. Cl. 260—32.6 R 17 Claims

1. A composition which is stable under anhydrous conditions but curable at room temperature upon exposure to moisture to a silicone elastomer consisting essentially of a product obtained by mixing

A. 100 parts by weight of a hydroxyl endblocked polydimethylsiloxane having a viscosity at 25° C of from 1 to 100 Pa·s,

B. 0 to 200 parts by weight of a non-acidic, non-reinforcing filler,

C. 2.5 to 10 parts by weight of a silane of the general formula



in which R is an organic radical selected from the group consisting of methyl and phenyl,

D. 1 to 6 parts by weight of an aminoxysilicon compound having from 1 to 100 silicon atoms per molecule and from 3 to 10 aminoxy groups per molecule, said aminoxy group having a general formula —OX in which X is a monovalent amine radical selected from the group consisting of $-NR'_2$ and a heterocyclic amine, R′ is a monovalent hydrocarbon radical, —OX -OX group being bonded to silicon atoms through an Si—O bond, the remaining valences of the silicon atoms in the aminoxysilicon compound being satisfied by divalent oxygen atoms which link the silicon atoms of the aminoxysilicon compounds having two or more silicon atoms per molecule through silicon-oxygen-silicon bonds and by monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals bonded to the silicon atoms through silicon-carbon bonds, there being an average of at least one monovalent hydrocarbon radical or halogenated monovalent hydrocarbon radical per silicon atom,

said silane (C) and said aminoxysilicon compound being present in amounts sufficient to provide a combined weight of at least 5 parts by weight per 100 parts by weight of (A), and said aminoxysilicon compound being present in an amount which is not greater than the weight of the silane (C) and

E. 1 to 5 parts by weight of a polar solvent selected from the group consisting of N,N-dimethylformamide, acetonitrile and N-n-butylacetamide.

3,996,185

POLYEPOXY RESIN-DIARYL DIANHYDRIDE LAMINATING RESINS AND LAMINATES

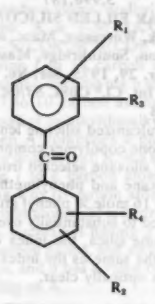
Walter P. Barie, Jr., Shaler Township, and Norman W. Franke, Penn Hills Township, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 310,412, Nov. 29, 1972, Pat. No. 3,914,512. This application Dec. 9, 1974, Ser. No. 531,186
Int. Cl.² C08K 5/07
U.S. Cl. 260—32.8 EP 8 Claims

1. A method for making a liquid epoxy resin-diaryl dianhydride impregnant for binding fibrous reinforcing material which comprises

1. a nonplasticizing 1,2-epoxy resin which contains on the average more than one 1,2-epoxy group per molecule,

2. an anhydride hardener comprising from about 15 to 100 weight percent of diphenyl dianhydride having the structural formula



where R_1 and R_2 are the anhydride group; and where R_3 and R_4 are monovalent radicals selected from hydrogen, an alkyl group having between one and five carbon atoms, and a halogen; and

up to about 85 percent of a nonplasticizing monoanhydride, and

3. a solvent having a boiling point no greater than about 110° C., selected from a lower alkyl ketone having up to five carbon atoms, a lower alkyl carboxylic acid ester having up to five carbon atoms, a chlorinated hydrocarbon having up to two carbon atoms, an aromatic hydrocarbon having up to seven carbon atoms, and a mixture thereof,

the steps comprising

a. mixing the epoxy resin and the anhydride hardener;

b. heating said epoxy resin-anhydride hardener mixture at a temperature between about 140° C. and about 190° C. until a homogeneous solution of the anhydride hardener and the epoxy resin is obtained without gelation of the anhydride hardener-epoxy resin solution; and

c. adding the said solvent having a boiling point no greater than about 110° C. to the said solution of anhydride hardener and epoxy resin at a temperature of about 100° C. to about 190° C. with cooling and under agitation whereby solution of the anhydride hardener- epoxy resin solution in said solvent is obtained.

3,996,186

STORAGE-STABLE EPOXIDE MOULDING COMPOSITIONS

Bruno Schreiber, Basel, and Hermann Diethelm, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1973, Ser. No. 423,365

Claims priority, application Switzerland, Dec. 14, 1972, 18262/72

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C08L *63/00, 63/06*

U.S. Cl. 260—37 EP **5 Claims**

1. Storage-stable, rapidly curing epoxide moulding compositions, characterised in that they contain

a. adducts, containing epoxide groups, from triglycidyl isocyanurate and cyclohexylamine or alkyl substituted cyclohexylamine,

b. adducts, containing amino groups, from cycloaliphatic or heterocyclic diamines and diglycidyl compounds, as curing agents and

c. inorganic or organic, pulverulent or fibrous fillers with the resin and curing agent pre-adducts softening between 45° and 120°C, melting 5° – 30°C above the softening point and being present in the moulding compositions predominantly in the form of discrete particles wherein components (a) and (b) are present in about equivalent amounts.

3,996,187

OPTICALLY CLEAR FILLED SILICONE ELASTOMERS

Edward A. Travnicek, Worcester, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 29, 1975, Ser. No. 572,788

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **2 Claims**

1. A reenforced vulcanized silicone lens consisting of 80 to 95% of (A) at least one copolymer comprising dimethyl siloxane and at least one siloxane selected from the group consisting of diphenyl siloxane and phenylmethyl siloxane, said copolymer having 6 to 16 mole % phenyl groups and at least one organo group bonded to substantially every silicon atom, and 5 to 20% of (B) fume silica, the index of refraction of (A) being substantially the same as the index of refraction of (B) whereby said lens is optically clear.

3,996,188

FLAME-RETARDANT SILICONE COMPOSITIONS

Thomas L. Laur, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 3, 1975, Ser. No. 637,244

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **18 Claims**

1. A silicone composition consisting essentially of:

a. 100 parts by weight of a polydiorganosiloxane gum, free of silicon-bonded hydrogen atoms, wherein each organic radical is selected from the group consisting of methyl, vinyl, 3,3,3-trifluoropropyl and phenyl, there being up to 2.0 percent vinyl radicals, up to 50 percent 3,3,3-trifluoropropyl radicals and up to 10 percent phenyl radicals based on the total number of organic radicals in the polydiorganosiloxane gum and from 1.98 to 2.002 organic radicals per silicon atom in the polydiorganosiloxane gum,

b. from 10 to 100 parts by weight of a reinforcing silica filler,

c. from 0.1 to 10 parts by weight of an alcoholproducing organic peroxide,

d. from 10 to 150 parts by weight per one million parts by weight of the polydiorganosiloxane gum of platinum as an unsupported platinum-containing material,

e. an effective amount of at least one additive selected from the group consisting of titanium dioxide, carbon black, Group II metal oxides, rare earth metal oxides and rare earth metal hydroxides, and

f. from 0.01 to 1.0 parts by weight of an aromatic acid selected from the group consisting of mononuclear aromatic acids and halogenated mononuclear aromatic acids.

3,996,189

OPTICALLY CLEAR FILLED SILICONE ELASTOMERS

Edward A. Travnicek, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 572,788, April 29, 1975. This application Mar. 17, 1976, Ser. No. 666,591

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **6 Claims**

1. An optically clear, reenforced vulcanized silicone elastomer comprising 80 to 95% by weight of

a. a copolymer comprising

i. dimethyl siloxane,

ii. diphenyl siloxane, or phenylmethyl siloxane or mixtures thereof, and

iii. vinyl siloxane;

b. a copolymer comprising

i. dimethyl siloxane,

ii. diphenyl siloxane or phenylmethyl siloxane or mixtures thereof, and

iii. siloxane having $(R)_2HSiO—$ or $—O—SiHR—O—$ groups, or both, wherein R is methyl or ethyl; with the proviso that each of fractions (a) and (b) has 6 to 16 mole percent phenyl and each contains no Part (iii) of the other;

c. 5 to 20% of a silica filler, the refractive index of said copolymer being substantially the same as the index of refraction of (c).

3,996,190

FORMALDEHYDE FUME ABATEMENT IN THE PRODUCTION OF UREA/FORMALDEHYDE MOLDING RESINS

Charles T. O'Neill, Petersburg, Mich., and Edward L. Steiger, Toledo, Ohio, assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 15, 1975, Ser. No. 613,378

Int. Cl.² C08G *12/12*

U.S. Cl. 260—39 R **15 Claims**

1. In the production of urea/formaldehyde molding resins, wherein urea and formaldehyde are reacted under alkaline conditions to form a liquid resinuous composition, the composition is blended with a filler and the filled composition is dried, the improvement comprising reducing the level of formaldehyde fumes discharged during drying by a process which comprises the steps of:

a. charging urea and formaldehyde to a reaction vessel in amounts to provide an initial mol ratio of formaldehyde to urea of about 1.0 to 2.0 mols formaldehyde per mol urea;

b. reacting the urea and formaldehyde in water at a temperature in the range of about 50° to 65° C. and at a pH of about 7.0 to 9.0;

c. continuing the reaction until the mol ratio of formaldehyde to urea in the resin is at least about 75% of the initial mol ratio; and

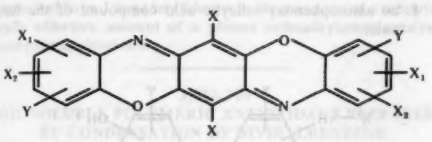
d. adding additional urea in an amount of from about 0.5 to 10 percent by weight based upon the amount of urea initially charged; whereby the amount of formaldehyde discharged to the atmosphere during drying is reduced.

3,996,191
PROCESS FOR THE DOPE DYEING OF LINEAR POLYESTERS

Andre' Pugin, Riehen; Kurt Burdeska, Basel, and Jost von der Crone, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 10, 1971, Ser. No. 197,489
Claims priority, application Switzerland, Nov. 20, 1970, 17232/70
Int. Cl.² C08K *5/35*
U.S. Cl. 260—40 P 3 Claims

1. A polyester having incorporated therein a dyestuff of the formula



wherein X represents chlorine or bromine, Y represents an etherified oxy group, X_1 represents hydrogen, halogen, alkyl, an etherified oxy group, trifluoromethyl, cyano or alkylsulphonyl and X_2 represents hydrogen or halogen.

3,996,192
SPIN-DYEING OF ACRYLONITRILE HOMOPOLYMERS AND COPOLYMERS

Manfred Hahnke, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 14, 1975, Ser. No. 558,343
Claims priority, application Germany, Mar. 20, 1974, 2413299
Int. Cl.² C08K *5/18*
U.S. Cl. 260—42.21 14 Claims

1. In a process for the spin-dyeing of acid-modified polymers containing acrylonitrile units with basic dyestuffs the improvement comprising adding to the spinning solution a salt of a dyestuff containing at least one arylamino group which salt is sparingly soluble or insoluble in water.

3,996,193
ANTIOXIDANTS

Anthony M. DeRoo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1968, Ser. No. 754,463
Int. Cl.² C08K *5/17*
U.S. Cl. 260—45.9 R 9 Claims

1. A composition comprising an admixture of (a) a natural or synthetic diolefin rubber, or a mixture thereof, (b) an anti-oxidizing amount of a polyalkylene-polyamine having a molecular weight of at least 600 and consisting essentially of repeating units of the formula

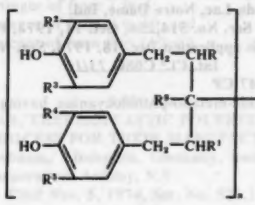
wherein each R independently is alkylene of from 2 to 6 carbon atoms, not more than 4 carbon atoms in R being in the backbone; and each R' independently is hydroxy- or cyano-substituted alkyl having up to 12 carbon atoms or aralkyl or halo-, hydroxyl-, or alkyl-substituted aralkyl having up to 16 carbon atoms.

3,996,194
1,5-BIS(3',5'-DI-HYDROCARBYL-4'-HYDROXY-PHENYL)PENTYL DERIVATIVES

Richard A. Gencarelli, Cheshire, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 285,969, Sept. 5, 1972, abandoned. This application Feb. 26, 1975, Ser. No. 553,338
Int. Cl.² C08K *5/20*; C07C *103/78*
U.S. Cl. 260—45.85 S 27 Claims

1. A compound having the formula



wherein R and R^1 may be the same or different and are hydrogen, alkyl having 1 to 4 carbon atoms, alkylene or alkylidene having 1 to 3 carbon atoms and participating in a carbocyclic ring having 5 to 7 carbons, said ring including the carbon to which A is attached, R^2, R^3, R^4 and R^5 are hydrogen, alkyl of from 1 to 9 carbons, cycloalkyl having 5 to 7 carbon atoms, aryl having 6 to 10 carbon atoms, aralkyl or alkaryl of from 7 to 10 carbon atoms; A is $-N(R^6)COR^6$, $-N(R^6)COR^7-CON(R^6)-$ and $-N(COR^6)R^7N(COR^6)-$, wherein R^6 is hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms, aryl having 6 to 10 carbons, aralkyl and alkaryl having 7 to 10 carbon atoms, hydroxyalkyl, alkoxyalkyl, alkylaminoalkyl or alkylthioalkyl having 2 to 5 carbon atoms; and when A comprises a plurality of R^6 groups they may be the same or different; R^7 is a single bond, alkylene or alkylidene having 1 to 8 carbon atoms, oxydialkylene or thiodialkylene having 4 to 10 carbon atoms, and arylene having from 6 to 10 carbon atoms; R^8 is hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, aryl having 6 to 10 carbon atoms, and alkaryl or aralkyl having 7 to 10 carbon atoms; and n has a value of 1 or 2 corresponding to the functionality of A.

3,996,195
CURABLE ORGANOSILICON COMPOSITIONS

Yasuhiko Sato, and Hiroshi Inomata, both of Annaka, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Nov. 15, 1974, Ser. No. 524,220
Int. Cl.² C08L *83/06*
U.S. Cl. 260—46.5 Y 11 Claims

1. An organosilicon composition comprising

a. an organopolysiloxane composed of from 15 to 75 mole % of the organosiloxane units represented by the general formula $R^1SiO_{1.5}$, from 25 to 85 mole % of the organosiloxane units represented by the general formula R^2R^3SiO and from 0 to 5 mole % of the organosiloxane units represented by the general formula $R^4R^5R^6SiO_{0.5}$, where R^1, R^2, R^3, R^4, R^5 and R^6 each are the same or different monovalent hydrocarbon groups, from 2.0 to 40 mole % of said hydrocarbon groups being vinyl groups,

b. an organohydrogenpolysiloxane miscible with component (a), having from 2 to 6 silicon atoms in one molecule, at least 2 hydrogen atoms directly bonded to silicon atoms in one molecule and at least one of the groups selected from epoxy and ester groups bonded to the silicon atoms through carbon atoms in one molecule, in an amount such that its hyrogen atoms directly bonded to the silicon atoms are from 0.7 to 1.5 times the equimolar amount of the vinyl groups contained in component (a),

c. catalytic amount of platinum or a platinum compound.

3,996,196

POLYIMIDE-METALLO-PHTHALOCYANINES AND THEIR PREPARATION

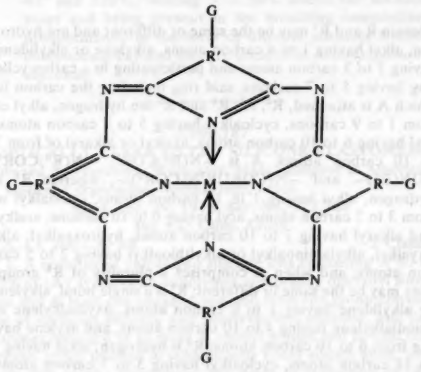
Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Division of Ser. No. 514,256, Oct. 11, 1974, Pat. No. 3,890,274. This application Dec. 18, 1974, Ser. No. 533,889

Int. Cl.² C08G 73/10

U.S. Cl. 260—47 CP 17 Claims

1. A polyimide-metallo-phthalocyanine having the structural formula:

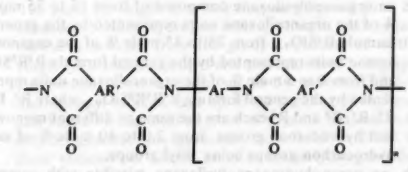


where

R′ is an aromatic organic radical, the two carbon atoms attached thereto being attached to separate and adjacent carbon atoms in the aromatic radical,

M is derived from a polyvalent metal or its salt, said polyvalent metal having an atomic number of at least 12 and

G is an aromatic imide of the formula:



wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical, and

n is a positive integer of at least one.

3,996,197

METHOD OF PREPARING POLYBENOXAZINDIONE POLYMERS FROM AMINOPHENOXY SALICYCLIC ACID COMPOUNDS

Rudolf Binsack, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 374,878, June 29, 1973, abandoned. This application Dec. 31, 1974, Ser. No. 537,664

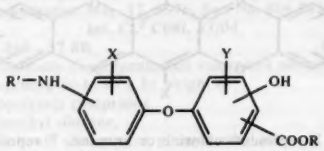
Claims priority, application Germany, July 1, 1972, 2232462

Int. Cl.² C08G 73/06

U.S. Cl. 260—47 CP 5 Claims

1. A process for the production of polybenz-1,3-oxazin(2,4)-diones, which comprises polycondensing at 150°-300° C.

1. an aminophenoxy salicylic acid compound of the formula:



wherein

R is hydrogen, C_1—C_4-alkyl, phenyl-C_1—C_4-alkyl, phenyl, or naphthyl;

R′ is hydrogen, C_1—C_4-alkyl carbonyl, phenylcarbonyl, phenyl-C_1—C_2-alkyl carbonyl, C_1—C_4-alkoxycarbonyl, or phenyl-C_1—C_4-alkoxycarbonyl; and

X and Y, independently of each other, are hydrogen, chloro, bromo, or C_1—C_4-alkyl; with

2. carbonic acid, aliphatic carbonate, aromatic carbonate, or halide.

3,996,198

ONE STEP PREPARATION OF LINEAR ANTIOXIDANT PHENOLIC POLYMERS INVOLVING USE OF IMPURE DIOLEFIN FEEDSTOCK AND ALUMINUM CATALYST UNDER ORTHO ALKYLATION CONDITIONS

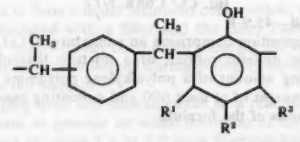
Patricia C. Wang, Palo Alto, and James A. Dale, Menlo Park, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Feb. 24, 1975, Ser. No. 552,059

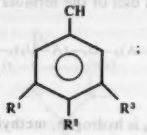
Int. Cl.² C08G 65/40; C08F 4/52

U.S. Cl. 260—62 6 Claims

1. The process for preparing a polymer comprising not less than 6 nor more than 80 diolefin phenolic units of the formula



wherein one of R^1, R^2 and R^3 is hydrogen and the remaining members of R^1, R^2 and R^3 independently are selected from the group consisting of hydrogen, lower alkyls of from 1 to 6 carbon atoms, aralkyls of from 8 to 14 carbon atoms, and alkoxys and aralkyloxys of from 1 to 14 carbon atoms, which comprises contacting a liquid hydrocarbon mixture containing from 50 to 85% by weight divinylbenzene with the remainder being essentially ethylvinylbenzene and diethylbenzene with phenolic of the formula



the molar ratio of divinylbenzene to phenolic being from 1.1:1 to 1:1.5; the contacting being effected in an amount of aprotic liquid reaction solvent to give an initial concentration of divinylbenzene of from 0.1 to 10 moles per liter; the contacting being effected at a temperature of from 80° to 250° C for a period of from 1 hour to 48 hours in the presence of a catalytically effective amount of a phenol orthoalkylation catalyst comprising aluminum.

3,996,199
OIL SOLUBLE POLYMERIC ANTIOXIDANT PREPARED BY CONDENSATION OF DIVINYLBENZENE, HYDROXYANISOLE, TERTIARY BUTYL HYDROQUINONE, TERTIARY BUTYL PHENOL AND BISPHENOL A UNDER ORTHO ALKYLATION CONDITIONS

Ned M. Weinshenker, Palo Alto; Leonard A. Bunes, San Carlos, and Roman Davis, Palo Alto, all of Calif., assignors to Dynapol Corporation, Palo Alto, Calif.

Filed Feb. 17, 1976, Ser. No. 658,943
Int. Cl.² C08K 5/13
U.S. Cl. 260—62 6 Claims

1. The polymer product having a peak molecular weight of from about 4000 to about 12000 which results when divinylbenzene is condensed in aprotic organic solvent with a mixture of phenolics comprising hydroxyanisole, tertiarybutylhydroquinone, tertiarybutylphenol and bisphenol A in the presence of a catalytically effective amount of a catalyst for the orthoalkylation of hydroxyaromatics under ortho ring alkylation conditions, said divinylbenzene and phenolics being in the relative molar proportions of:

divinylbenzene	2.0–2.3 Equivalents of vinyl per mole of phenolics
hydroxyanisole	0.25–.50
tertiarybutyl-hydroquinone	0.07–.20
tertiarybutyl-phenol	0.15–45
bisphenol A	0.05–15

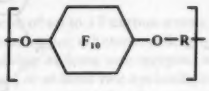
the initial concentration of divinylbenzene in the solvent being in the range of from about 0.1 to about 20 moles per liter.

3,996,200
PERFLUORINATED PARA-DIKETONE POLYMERS

Harold E. Doorenbos, and Hughie R. Frick, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

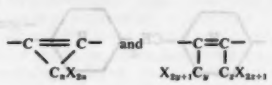
Division of Ser. No. 448,135, March 4, 1974, Pat. No. 3,931,325. This application Sept. 11, 1975, Ser. No. 612,390
Int. Cl.² C08G 16/00
U.S. Cl. 260—63 HA 16 Claims

1. A polymer having as a repeating unit



wherein

R is a divalent radical selected from the group consisting of



wherein

X is halogen selected from the group consisting of fluorine, chlorine, bromine, iodine, or any stable combination thereof within the same molecule:

n is an integer of from 1 to 4;

y is an integer of from 0 to 10; and

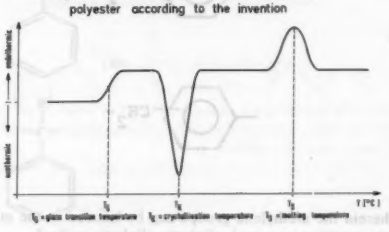
z is an integer of from 0 to (10−*i*).

3,996,201
LINEAR, THERMOPLASTIC POLYESTERS AND PROCESS FOR THEIR MANUFACTURE

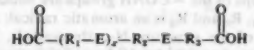
Lothar Buxbaum, Lindenfels, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,127
Claims priority, application Switzerland, Nov. 13, 1973, 15955/73
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C08G 63/68
U.S. Cl. 260—75 N 24 Claims

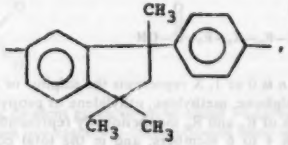
Graph of the thermogram of a thermoplastic polyester according to the invention



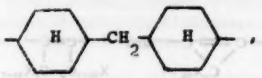
1. A linear, thermoplastic polyester with a high glass transition temperature and a relative viscosity of 1.1 to 4.0 dl/g, measured at 30°C in a 1% solution of equal parts phenol and trichloroethane consisting essentially in the total condensed acid component of (A) 0 to 90 mol % of an acid selected from the group consisting of terephthalic acid and isophthalic acid or a mixture thereof; and of (B) 10 to 100 mol % of a dicarboxylic acid selected from the group consisting of an amidodicarboxylic acid of the formula

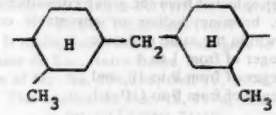


wherein *x* is 0 or 1, E is the —CONH— group the NH group of which is bonded to R_2 or R_3 or optionally to R_1 or R_2, and each of R_1, R_2 and R_3 independently is alkylene of 1 to 12 carbon atoms, an aromatic radical phenylene, diphenylene, naphthylene, 4,4′-sulphonediphenyl or

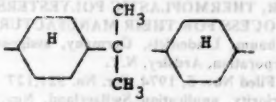


a cycloaliphatic radical

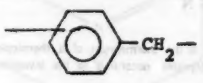




or



an aromatic-aliphatic radical



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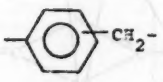
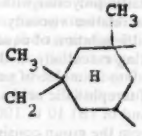
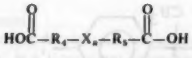


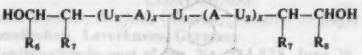
wherein the methylene groups can be bonded in the meta or para- position or a cycloaliphatic-aliphatic radical



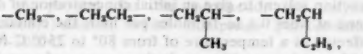
with the proviso that, if x is 1, R_2 cannot be the methylene group when the NH groups of the —CONH groups are bonded to R_2 and that one of R_1, R_2 and R_3 is an aromatic radical; an imidodicarboxylic acid of the structure N-carboxyalkyl-, N-carboxyphenylalkyl, N-carboxyalkylphenyl- or N-carboxyphenyltrimellitic acid imide or N,N′-carboxyalkyl-, N,N′-carboxyphenylalkyl-, N, N′-carboxyalkylphenyl-, or N, N′-carboxyphenylpyromellitic acid imide; a naphthalene dicarboxylic acid; a carboxyphenylindane carboxylic acid; and a dicarboxylic acid of the general formula

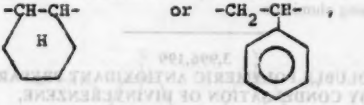


wherein n is 0 or 1, X represents the sulphur or oxygen atom, or the sulphone, methylene, ethylidene or propylidene radical and each of R_4 and R_5 independently represents a carboxylic ring with 4 to 6 members; and in the total condensed diol component of (C) 5 to 100 mol % of a diol selected from the group consisting of a diol of the formula

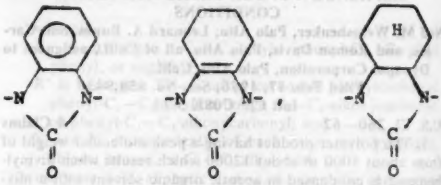


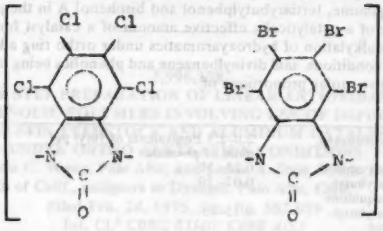
where X is 0 or 1, R_6 is hydrogen, methyl, ethyl or phenyl, R_7 is hydrogen or together with R_6 is tetramethylene, A represents a radical of the formula



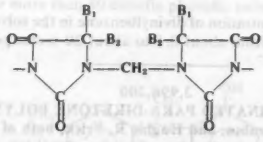


U_1 represents a radical of the formula

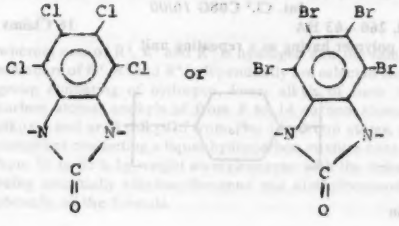




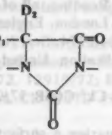
or



wherein each of B_1 and B_2 independently represents hydrogen or alkyl with 1 to 4 carbon atoms; or when X is 0, U_1 can be



and U_2 has the same meaning as U_1 or represents the formula



wherein each of D_1 and D_2 independently represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl or together D_1 and D_2 are pentamethylene; and of (D) 0 to 95 mol % of a diol selected from the group consisting of an aliphatic diol with 2 to 10 carbon atosm, 1,4-cyclohexanedimethanol and 1,4-cyclohexanediol or a mixture thereof.

3,996,202

PROCESS FOR THE PREPARATION OF SULFONATE GROUP CONTAINING AROMATIC POLYAMIDES

Günter Keil, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

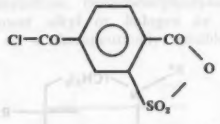
Filed Apr. 24, 1975, Ser. No. 571,440

Claims priority, application Germany, Apr. 27, 1974, 2420530

Int. Cl.² C08G *69/42*

U.S. Cl. 260—78 R **1 Claim**

1. In a process for the manufacture of articles selected from fibers, filaments and sheets by polycondensing a sulfur-containing monomer with an aromatic dicarboxylic acid dichloride, an aromatic diamine and from 0 to about 5 mole percent, based on the total amount of dicarboxylic acid, of a monomer selected from aliphatic and cycloaliphatic dicarboxyic acid dichlorides and diamines, and forming said article from the resulting polymer, the improvement which comprises using as the sulfur-containing monomer about 2 to 15 mole percent, based on the total amount of dicarboxylic acid units, of a compound of the formula:



3,996,203

SOLUTION PROCESS FOR THE PREPARATION OF POLYIMIDES FROM DIAMINES AND ANHYDRIDES

John D. Hand, and Wendell G. Whitehouse, both of Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 288,631, Sept. 13, 1972, Pat. No. 3,868,351, which is a continuation of Ser. No. 94,529, Dec. 2, 1970, abandoned. This application July 15, 1974, Ser. No. 488,640

Int. Cl.² C08G *69/26*

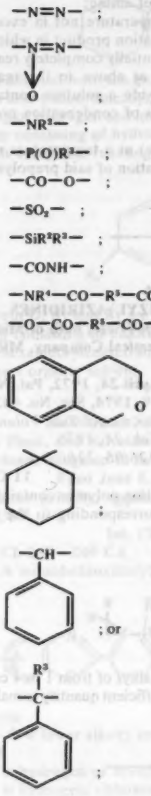
U.S. Cl. 260—78 UA **2 Claims**

1. A process for the preparation of a solid polyimide prepolymer which comprises

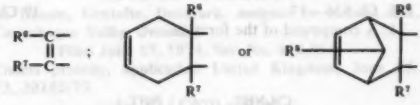
a. dissolving a difunctional amine having (1) the formula

$$H_2N - R - NH_2$$

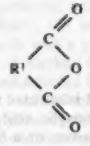
where R is alkylene of up to 12 carbon atoms; cycloalkylene of from 5 to 6 carbon atoms; a heterocyclic group of from 4 to 5 carbon atoms having at least one oxygen, nitrogen or sulfur atom in the group; or at least two cycloalkylene groups joined by a direct carbon-to-carbon bond or separated by oxygen, sulfur, alkylene group of from 1 to 3 carbon atoms or



wherein R^2, R^3 and R^4 are alkyl of from 1 to 6 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms, or mono- or dicarbocyclic aryl; and R^5 is divalent alkyl of up to about 12 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms, or mono- or dicarbocyclic arylene; and R^1 is



where R^6, R^7 and R^8 are hydrogen or alkyl of from one to six carbons, and an anhydride of an aliphatically unsaturated dicarboxylic acid having the formula



where R^1 is a divalent group of up to about 30 carbon atoms and has at least one carbon-to-carbon double bond in an inert

solvent to form a solution containing from about 2 to about 3 moles of anhydride for each mole of amine;

b. heating said solution at a temperature not in excess of about 75° C to form a condensation product in which the amine groups have been substantially completely reacted;

c. adding a difunctional amine as above to the reaction mixture from step (b) to provide a solution containing from about 2 to about 3 moles of condensation product for each mole of amine; and

d. heating the solution of step (c) at a temperature not in excess of about 75° until formation of said prepolymer is substantially complete.

3,996,204

NOVEL N-(AR-VINYLBENZYL)AZIRIDINES

Donald A. Tomalia, and Jerry D. DeVrieze, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

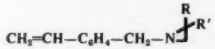
Division of Ser. No. 246,872, April 24, 1972, Pat. No. 3,833,557. This application Feb. 19, 1974, Ser. No. 443,563

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C08F *26/06, 126/06, 226/06*

U.S. Cl. 526—263 **11 Claims**

1. A thermally curable vinyl addition polymer containing an N-(m or p-vinylbenzyl)aziridine corresponding to the structural formula



wherein R and R′ are hydrogen or alkyl of from 1 to 4 carbon atoms in interpolymerized form in sufficient quantity to make the polymer thermally curable.

3,996,205

AMINOGLYCOSIDE ANTIBIOTICS AND INTERMEDIATES

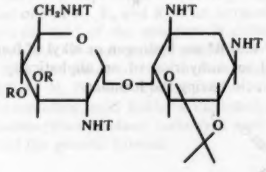
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 8, 1975, Ser. No. 611,349

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **39 Claims**

1. A compound of the formula



wherein T is an amino blocking group and R is selected from the group consisting of a hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive.

3,996,206

PROCESS OF MAKING SUCROSE ESTERS

Kenneth John Parker, Oxted; Riaz Ahmed Khan, Sonning, and Khizar Sultan Mufti, Reading, all of England, assignors to Tate & Lyle Limited, London, England

Filed Mar. 6, 1974, Ser. No. 448,695

Claims priority, application United Kingdom, Mar. 16, 1973, 12794/73

Int. Cl.² C08B *37/00*

U.S. Cl. 536—119 R **15 Claims**

1. A process for preparing a surfactant, which comprises reacting solid particulate sucrose with at least one triglyceride in the presence of a basic transesterification catalyst, at a temperature in the range of from 110° to 140° C, at atmospheric pressure without distilling off any of the components, and in the absence of any solvent.

3,996,207

DERIVATIVES OF TETRAHYDRO-1H-1,3-DIAZEPINE AND HEXAHYDRO-1,3-DIAZOCINE

Alan Chapman White, Windsor, and Robin Michael Black, Porton, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

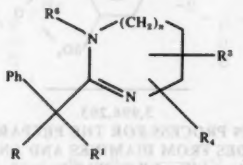
Continuation-in-part of Ser. No. 472,759, May 23, 1974, Pat. No. 3,926,994, which is a continuation-in-part of Ser. No. 309,580, Nov. 24, 1972, abandoned. This application May 29, 1975, Ser. No. 582,038

Claims priority, application United Kingdom, Dec. 14, 1971, 1250/71; Mar. 15, 1972, 12069/72; Nov. 30, 1972, 11199/72; May 31, 1973, 26079/73

Int. Cl.² C07D *243/04, 245/02*

U.S. Cl. 260—239 BC **5 Claims**

1. A compound selected from the group consisting of bases having the formula



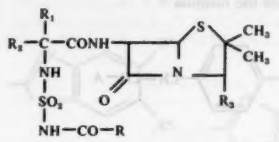
and the pharmaceutically acceptable acid addition salts thereof, wherein n represents 2 or 3, R^3 and R^4 which may be the same or different each represent a member of the group consisting of hydrogen and alkyl containing from one to six carbon atoms, Ph represents a member of the group consisting of phenyl, halophenyl, alkylphenyl wherein the alkyl radical contains from one to six carbon atoms, dialkylphenyl wherein the alkyl substituents each contain from one to six carbon atoms and alkoxyphenyl wherein the alkoxy substituent contains from one to six carbon atoms, R is a member of the group consisting of hydroxyl, halogen and alkoxy containing from one to six carbon atoms, R^1 is a member of the group consisting of phenyl, halophenyl, alkylphenyl wherein the alkyl substituent contains from one to six carbon atoms, dialkylphenyl wherein the alkyl substitutents each contain from one to six carbon atoms, alkoxyphenyl wherein the alkoxy substituent contains from one to six carbon atoms and naphthyl, and R^6 is a member of group consisting of hydrogen and alkyl containing from one to six carbon atoms.

3,996,208
6-ACYLAMINO-PENAM-3-CARBOXYLIC ACIDS

Bruno Fechtig, Reinach; Karoly Kocsis, Basel, and Hans Bikel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 21, 1973, Ser. No. 344,020
Claims priority, application Switzerland, Mar. 22, 1972, 4251/72; Sept. 1, 1972, 12919/72; Dec. 20, 1972, 18530/72
Int. Cl.² C07D *499/46*
U.S. Cl. 260—239.1 **12 Claims**

1. A compound of the formula



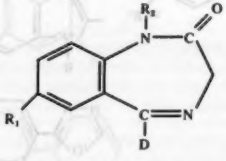
wherein R_3 denotes a free carboxy group, R_1 denotes hydrogen and R_2 denotes phenyl, thienyl or furyl or R_1 and R_2 together with the carbon atom form cycloalkyl having 4 to 7 carbon atoms and R represents hydrogen or a member selected from the group consisting of lower alkyl, lower alkyl mono- or disubstituted by lower alkoxy, lower alkanoyl, cyano, phenoxy, lower alkoxycarbonyl, halogen, or halogenphenoxy, phenyl, phenyl monosubstituted by di-lower alkylamino, lower alkanoylamino, carbamoyl, halogen, lower alkylsulphonamido, nitro, lower alkoxy or carboxy, naphthyl, phenyl-lower alkyl, pyridyl, pyridyl monosubstituted by lower alkyl, lower alkoxy, carbamoyl, di-lower alkylamino, lower alkanoylamino, lower alkoxycarbonyl hydroxy or halogen, furyl, thienyl, pyrrolyl, pyrazinyl, imidazolyl, or pyrimidinyl, lower alkoxy, alkoxy monosubstituted by lower alkoxy, di-lower alkylamino or mono- di- or trisubstituted by halogeno, phenyloxy, phenyloxy mono- or di-substituted by halogeno or di-lower alkylamino, naphthyloxy, phenylamino, N-lower alkyanoylphenylamino, morpholino, methanesulphonylamino, benzenesulphonylamino, benzenesulphonylamino monosubstituted by lower alkyl or halogen or naphthalenesulphonylamino, or a therapeutically useable ester or salt thereof.

3,996,209
PROCESS FOR PREPARING BENZODIAZEPINES

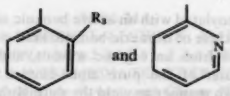
George Oswald Chase, Hawthorne, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 359,814, May 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 282,217, Aug. 21, 1972, abandoned. This application June 2, 1975, Ser. No. 583,234
Int. Cl.² C07D *243/28,401/04*
U.S. Cl. 260—239.3 D **16 Claims**

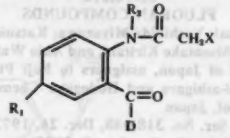
1. A process for preparing a compound of the formula



wherein D is selected from the group consisting of



R_1 is selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl; R_2 is selected from the group consisting of hydrogen and lower alkyl; and R_3 is selected from the group consisting of hydrogen and halogen which comprises reacting a compound of the formula



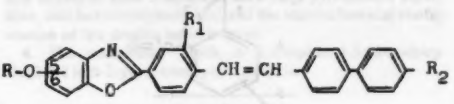
wherein D, R_1 and R_2 are as above and X is selected from the group consisting of chlorine, bromine and iodine with hexamethylenetetramine in the presence of ammonia and an inert organic solvent.

3,996,210
MONOBENZOXAZOLYLSTILBENES

Fritz Fleck, and Salvatore Valenti, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed June 8, 1970, Ser. No. 44,659
Claims priority, application Switzerland, June 13, 1969, 9052/69
Int. Cl.² C07D *263/56*
U.S. Cl. 260—240 CA **7 Claims**

1. A monobenzoxazolylstilbene of the formula



wherein

R—O is lower alkoxy and stands in one of the positions 5 or 6,

R_1 is hydrogen or lower alkyl, and

R_2 is hydrogen, chlorine or lower alkyl.

3,996,211
ALPHA-ISOMER OF 2-CHLORO-9-[3'-(N'-2-HYDROXYETHYLPIPERAZINO-N)-PROPYLIDENE]-THIAXANTHENE, CARBOXYLIC ACID ESTERS THEREOF AND ACID ADDITION SALTS OF THESE COMPOUNDS

Niels Lassen, Gentofte, Denmark, assignor to Kefalas A/S, Copenhagen Valby, Denmark

Filed June 17, 1974, Ser. No. 479,814
Claims priority, application United Kingdom, June 25, 1973, 30152/73
Int. Cl.² C07D *409/06*
U.S. Cl. 260—240 TC **9 Claims**

1. A compound selected from the group consisting of (1) the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, melting at 84°–85° Centigrade, free of the beta-isomer, (2) an ester thereof with a carboxylic acid having from one to sixteen carbon atoms inclusive, (3) and an acid addition salt of one of said compounds with a pharmaceutically acceptable acid.

6. A method for the preparation and purification of a compound selected from the group consisting of (1) the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, (2) an ester thereof, and (3) an acid addition salt of these compounds, characterized in that from a mixture of isomers containing from 30–35% of the alpha-isomer most of the beta-isomer is removed by crystallization from an organic solvent, the mother liquor evaporated,

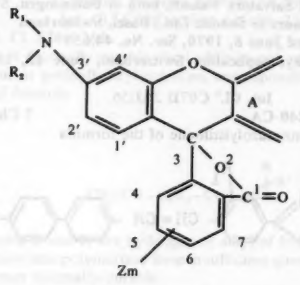
the residue benzoylated with an active benzoic acid derivative, the resulting mixture of isomeric benzoic acid esters subjected to crystallization from an organic solvent, and the resulting benzoic acid ester of the pure alpha-isomer saponified or reduced in known manner to yield the pure alpha-ismer which is isolated as such or in the form of a non-toxic acid addition salt thereof.

3,996,212
FLUORAN COMPOUNDS

Minoru Ozutsumi; Yoshihide Miyazawa; Katsuichi Motohashi, all of Tokyo; Masatake Kiritani, and Akio Watanabe, both of Fujimiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara and Hodogaya Chemical Co., Ltd., Tokyo, both of, Japan

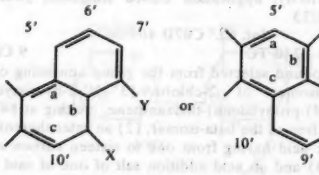
Division of Ser. No. 318,048, Dec. 26, 1972, Pat. No. 3,884,506. This application Jan. 9, 1975, Ser. No. 539,887
Claims priority, application Japan, Dec. 24, 1971, 46-104645
Int. Cl.² C07D *493/10*
U.S. Cl. 260—240 G **1 Claim**

1. Fluoran compounds represented by the formula:



wherein R_1 represents a hydrogen atom or a lower alkyl group containing 1 to 4 carbon atoms; R_2 represents a lower alkyl group containing 1 to 4 carbon atoms; Z represents one or more of a hydrogen atom, chlorine atom or nitro group; m represents an integer of from 1 to 4; and

represents a naphthalene ring of the formula;



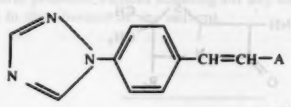
wherein one of X and Y represents a hydrogen atom and the other represents an —N=CH—B group; one of X′ and Y′ represents a hydrogen atom and the other represents —N=λ CH—B group; wherein B represents a lower alkyl group containing 1 to 7 carbon atoms, propenyl, styryl, phenyl or naphthyl group, and where said phenyl or naphthyl group may be substituted with methyl, methoxy, hydroxy, dimethylamino, nitro group or chlorine atom.

3,996,213
1,2,4-TRIAZOLYL-(1) DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS OPTICAL BRIGHTENERS

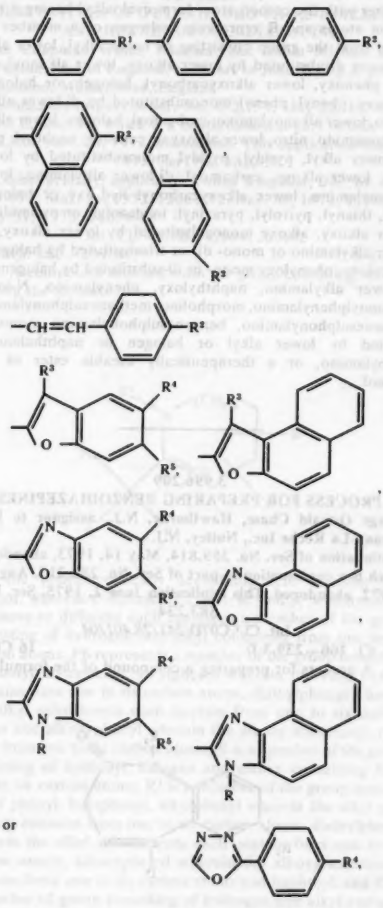
Erich Schinzel; Hans Frischkorn, both of Hofheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 2, 1975, Ser. No. 582,683
Claims priority, application Switzerland, June 6, 1974, 7749/74
Int. Cl.² C07D *249/09*
U.S. Cl. 260—240 C **6 Claims**

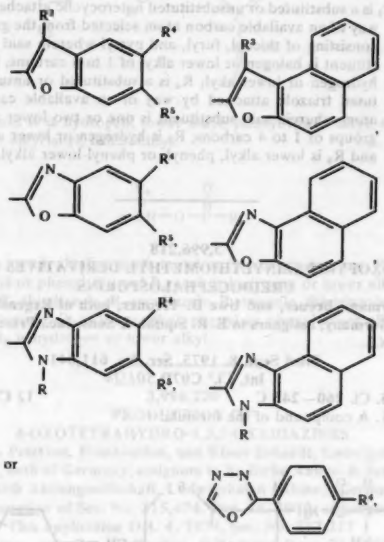
1. A compound of the formula



and the corresponding lower alkyl quaternary salt thereof wherein A is a group of the formula

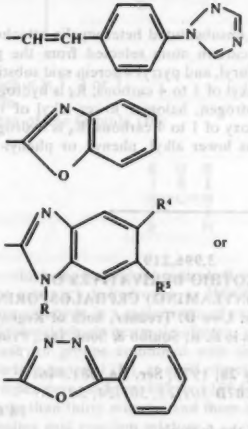


R is hydrogen or lower alkyl, R^1 is a group of the formula



or

R^3 is hydrogen or lower alkyl, R^4 and R^5 are hydrogen, cyano, lower alkyl, lower alkoxy or phenyl, carbo lower alkoxy, lower alkanoylamino and R^2 is hydrogen, sulfonamido, sulfonic acid, sulfonic acid lower alkyl ester, di lower alkyl carbonamido di lower alkyl-amino lower alkyl carbonamido, di hydroxy lower alkyl carbonamido, carbo lower alkoxy, cyano, or a group of the formulae



or

3,996,214

5-(1,1-DIPHENYL-4-(CYCLIC AMINO) BUT-2-TRANS-EN-1-YL)-2-ALKYL-1,3,4-OXADIAZOLES AND INTERMEDIATES THERETO

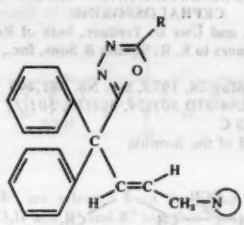
Esam Z. Dajani, Buffalo Grove, and Chung H. Yen, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,206

Int. Cl.² C07D *413/06, 221/20, 401/00*

U.S. Cl. 260—240 R 4 Claims

1. A compound of the formula



(I)

wherein R is a lower alkyl containing from 1 to 6 carbon atoms:

is a cyclic secondary amine residue selected from the group consisting of azabicycloalkyl containing 6 to 9 carbon atoms and having at least 5 atoms in each ring, pyrrolidino, piperidino, and hexamethylenimino; and the stereochemical configuration of the double bond is trans.

4. The compound which is 2,2-diphenyl-5-(2-azabicyclo[2.2.2]oct-2-yl)-3-trans-pentenenitrile.

3,996,215

STYRYL AND BUTADIENYL SULFO DYE AND PROCESS OF PRODUCING THE DYE

Teruo Kobayashi; Masatoshi Sugiyama, and Hiroshi Sawaguchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

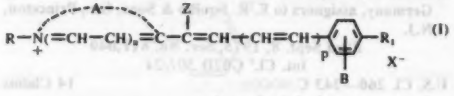
Filed Sept. 27, 1974, Ser. No. 510,252

Claims priority, application Japan, Sept. 27, 1973, 48-108799

Int. Cl.² C07D *209/04, 217/00, 263/12*

U.S. Cl. 260—240.9 17 Claims

1. A styryl and butadienyl dye having the formula (I)



(I)

wherein R represents a lower alkyl group, a sulfo lower alkyl group, a sulfo lower alkenyl group, or a carboxy lower alkyl group; A represents the atoms necessary for forming a 5-membered or 6-membered heterocyclic ring; Z represents a hydrogen atom, a methyl group, or a phenyl group; B represents a hydrogen atom, a lower alkyl group, a hydroxyl group, an alkoxy group, a halogen atom, a nitro group, a carboxyl group, an acylamino group, an alkoxycarbonylamino group, an alkylsulfonylamino group, or an alkylthio group; R_1 represents

R_3 and R_4, which may be the same or different, each repre-

sents a hydrogen atom, an alkyl group, an aralkyl group, an aryl group, an arylsulfonyl group, or an acetyl group; at least one of said R_3 and R_4 containing, however, at least one sulfo group; X^- represents an acid anion; and n and p each represents 0 or 1.

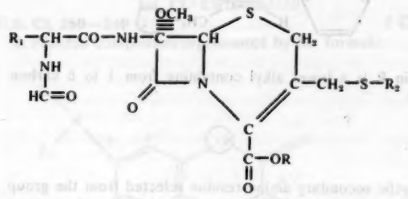
3,996,216

3-HETEROTHIO DERIVATIVES OF (FORMYLAMINO)ACETYLAMINO-7-ALPHA-METHOXY CEPHALOSPORINS

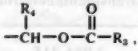
Hermann Breuer, and Uwe D. Treüner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 28, 1975, Ser. No. 581,443
Int. Cl.² C07D *501/24, 501/36, 501/22*
U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl,



alkali metal, alkaline earth metal or (lower alkyl)amine; R_1 is thienyl or phenyl; R_2 is R_3-thiadiazole, R_3-oxadiazole, R_3-triazole, thiatriazole, R_3-tetrazole or 1-oxopyridine; R_3 is lower alkyl, phenyl or phenyllower alkyl; and R_4 and R_5 each is hydrogen or lower alkyl.

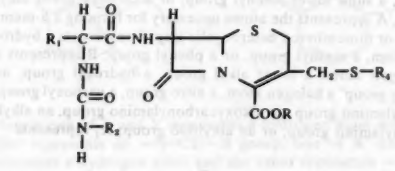
3,996,217

3-TRIAZOLYLTHIO DERIVATIVES OF UREIDO CEPHALOSPORINS

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

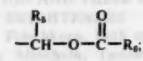
Filed Sept. 8, 1975, Ser. No. 611,040
Int. Cl.² C07D *501/24*
U.S. Cl. 260—243 C **14 Claims**

1. A compound of the formula:



wherein

R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, a salt forming ion, or



R_1 is a substituted or unsubstituted heterocyclic attached by way of an available carbon atom selected from the group consisting of thienyl, furyl, and pyrryl wherein said substituent is halogen or lower alkyl of 1 to 4 carbons; R_2 is hydrogen or lower akyl; R_4 is a substituted or unsubstituted triazole attached by way of an available carbon atom wherein said substituent is one or two lower alkyl groups of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; and R_6 is lower alkyl, phenyl, or phenyl-lower alkyl.

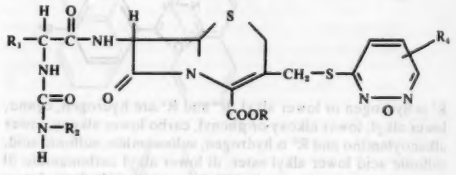
3,996,218

OXOPYRIDAZINYLTHIOMETHYL DERIVATIVES OF UREIDOCEPHALOSPORINS

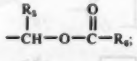
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 8, 1975, Ser. No. 611,041
Int. Cl.² C07D *501/24*
U.S. Cl. 260—243 C **12 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, a salt forming ion, or



R_1 is a substituted or unsubstituted heterocyclic attached by way of an available carbon atom selected from the group consisting of thienyl, furyl, and pyrryl wherein said substituent is halogen or lower alkyl of 1 to 4 carbons; R_2 is hydrogen or lower alkyl; R_4 is hydrogen, halogen, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; and R_6 is lower alkyl, phenyl, or phenyl-lower alkyl.

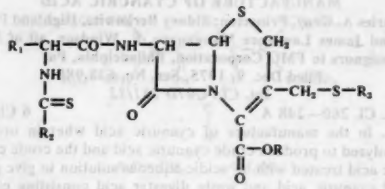
3,996,219

3-HETEROTHIO DERIVATIVES OF (α-THIOCARBONYLAMINO) CEPHALOSPORINS

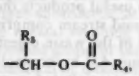
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 28, 1975, Ser. No. 581,446
Int. Cl.² C07D *501/22, 501/24, 501/36*
U.S. Cl. 260—243 C **14 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(-lower alkyl)silyl, trihaloethyl,



alkali metal, alkaline earth metal or (lower alkyl)amine; R_1 is thienyl or phenyl; R_2 and R_3 each is hydrogen or lower alkyl; R_5 is R_6-thiadiazole, R_6-oxadiazole, R_6-triazole, thiatriazole or R_6-tetrazole; R_4 is lower alkyl, phenyl or phenyl-lower alkyl; and R_6 is hydrogen or lower alkyl.

3,996,220
PRODUCTION OF 4-OXOTETRAHYDRO-1,3,5-OXADIAZINES

Harro Petersen, Frankenthal, and Klaus Erhardt, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

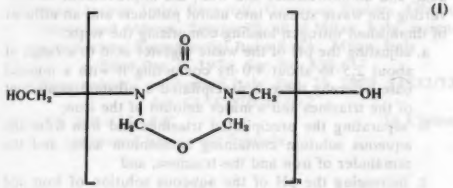
Continuation of Ser. No. 315,474, Dec. 15, 1972, abandoned. This application Oct. 4, 1974, Ser. No. 512,217

Claims priority, application Germany, Dec. 22, 1971, 2163854

Int. Cl.² C07D *273/04*

U.S. Cl. 260—244 R **7 Claims**

1. A process for the production of a methylolated 4-oxotetrahydro-1,3,5-oxadiazine of the formula (I):



(I)

in which n is 1, 2 or 3

wherein

a urea of the formula (II):

in which the individual radicals R are identical or different and each is hydrogen or $HOCH_2$ — is reacted with formaldehyde in a molar ratio of at least 4 minus x moles of formaldehyde per mole of urea, x being the number of methylol groups combined with the nitrogen atoms in starting material (II), at a pH of not more than 2.5 and a temperature of from 80° to 110° C for a period of not more than thirty minutes and there after neutralizing and cooling said reaction mixture.

3,996,221
DYESTUFFS

John Lindley Leng; Brian Parton; Denis Robert Annesley Ridyard, and John Robert Lawson, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

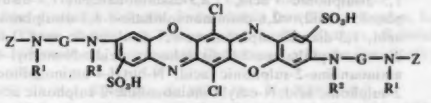
Filed Jan. 9, 1975, Ser. No. 539,744

Claims priority, application United Kingdom, Jan. 31, 1974, 4576/74

Int. Cl.² C07D *265/00, 273/00, 295/00*

U.S. Cl. 260—246 R **3 Claims**

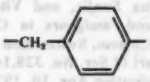
1. A dyestuff of the formula



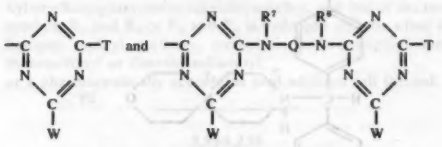
wherein

R^1 and R^2 are selected from the group consisting of H, CH_2SO_3H and R^1 and R^2 together being $—CH_2CH_2—$,

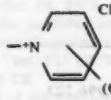
G is selected from the group consisting of $—CH_2CH_2—$, $—CH_2CH(OH)CH_2—$, $—CH_2—CH(OSO_3H)CH_2—$ and



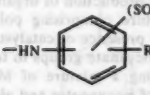
and each Z is independently selected from the group consisting of hydrogen, 2,3-dichloroquinoxaline-6-sulphonyl, trichloropyrimidinyl, dichloropyrimidinyl, 1,4-dichlorophthazine-6-carbonyl, dichloro-5-cyanopyrimidinyl, difluoro-5-chloropyrimidinyl, 1-(carboxylphenyl)-4,5-dichloro-6-pyridazonyl, dibromopyrimidinyl, tetrafluoro-cyclo-butylacryloyl,



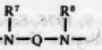
wherein W is selected from the group consisting of Cl and



wherein $n = 0$ or 1, T is selected from the group consisting of Cl, NH_2, $C_1^-{}_4$alkylamino, di($C_1^-{}_4$alkyl)amino, $C_1^-{}_4$alkoxy, $C_2^-{}_3$hydroxyalkylamino, di($C_2^-{}_3$hydroxyalkyl-)amino, sulphophenoxy N-(β-hydroxyethyl) sulphoanilino, N-(sulphomethyl)anilino, N-methylsulphoanilino, dicarboxyanilino, β-sulphatoethylamino, sulphomethylamino, sulphonaphthylamino, disulphonaphthylamino, trisulphonaphthylamino, and



wherein R^{10} is selected from the group consisting of hydrogen, CH_3, NO_2, NH_2, Cl and COOH and q is 0, 1 or 2, and wherein



is the N,N'-diradical of a diamine selected from the group consisting of 2,5-diaminobenzene sulphonic acid, 2,4-diaminobenzene sulphonic acid, 2,4-diaminobenzene-1,5-disulphonic acid, 2,5-diaminobenzene-1,4-disulphonic acid, 2,6-diaminonaphthaline-4,8-disulphonic acid, 1,5-diaminonaphthalene-3,7-disulphonic acid, 1,6-diaminonaphthalene-3,8-disulphonic acid, N-methyl-4-aminoaniline-2-sulphonic acid, N-butyl-4-aminoaniline-2-sulphonic acid, N-ethyl4-aminoaniline-2-sulphonic acid and N-(β-hydroxyethyl)-4-aminoaniline-2-sulphonic acid.

3,996,222

PIPERAZINE DERIVATIVES

Franjo Kajfez; Vesna Sunjic, and Vitomir Sunjic, all of Chiasso, Switzerland, assignors to CRC Compagnia de Ricerca Chimica, Chiasso, Switzerland

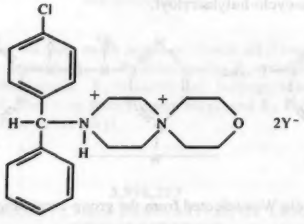
Continuation-in-part of Ser. No. 328,142, Jan. 30, 1973, abandoned. This application Apr. 10, 1974, Ser. No. 459,682

Claims priority, application Switzerland, Feb. 1, 1972, 1420/72

Int. Cl.² C07D *498/10*

U.S. Cl. 260—247.5 D 1 Claim

1. A compound having the formula



wherein Y is a halogen.

3,996,223

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES OF ISOCYANURATE STRUCTURE

Pramod Gupta, Bedburg; Roland Nast, Dormagen, and Erwin Windemuth, Bad Sooden-Allendorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 28, 1975, Ser. No. 626,404

Claims priority, application Germany, Nov. 6, 1974, 2452532

Int. Cl.² C07D *251/04*

U.S. Cl. 260—248 NS 11 Claims

1. A process for the production of organic polyisocyanates of isocyanurate structure comprising polymerizing organic polyisocyanates in the presence of catalysts which accelerate the trimerization of isocyanate groups to form isocyanurates, said catalyst comprising a mixture of Mannich bases and carbamic acid esters of isocyanates and alcohols with secondary hydroxyl groups.

3,996,224

MANUFACTURE OF CYANURIC ACID

Charles A. Gray, Princeton; Sidney Berkowitz, Highland Park, and James Lawrence Manganaro, E. Windsor, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 9, 1975, Ser. No. 638,988

Int. Cl.² C07D *251/32*

U.S. Cl. 260—248 A 6 Claims

1. In the manufacture of cyanuric acid wherein urea is pyrolyzed to produce crude cyanuric acid and the crude cyanuric acid treated with an acidic aqueous solution to give purified cyanuric acid and waste digester acid consisting essentially of a water solution of said mineral acid containing dissolved triazines of the group cyanuric acid and aminotriazines and ammonium salts and iron, the improvement of converting the waste stream into useful products thereby eliminating the need of disposing of said stream comprising the steps:

a. adjusting the pH of the waste digester acid to a range of about 2.5 to about 4.0 by contacting it with ammonia whereby there is precipitated a major amount of the triazines and a minor amount of the iron;

b. separating the precipitated triazines and iron from the aqueous solution containing ammonium salts of the mineral acid and the remainder of iron and trizines; and

c. recovering the aqueous solution of ammonium salts, iron and triazines from step (b).

3,996,225

MANUFACTURE OF CYANURIC ACID

Charles A. Gray, Princeton; Sidney Berkowitz, Highland Park, and James Lawrence Manganaro, East Windsor, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 9, 1975, Ser. No. 639,082

Int. Cl.² C07D *251/32*

U.S. Cl. 260—248 A 4 Claims

1. In the manufacture of cyanuric acid wherein urea is pyrolyzed to produce crude cyanuric acid and the crude cyanuric acid treated with an aqueous acidic solution to give purified cyanuric acid and a waste digester acid stream containing dissolved ammonium salts, triazines of the group cyanuric acid, and aminotriazines and iron, the improvement of converting the waste stream into useful products and an effluent of diminished nitrogen loading comprising the steps:

a. adjusting the pH of the waste digester acid to a range of about 2.5 to about 4.0 by contacting it with a mineral base whereby there is precipitated a substantial amount of the triazines and a minor amount of the iron;

b. separating the precipitated triazines and iron from the aqueous solution containing ammonium salts, and the remainder of iron and the triazines; and

c. increasing the pH of the aqueous solution of iron and triazines from step (b) to at least about 11 and stripping off ammonia thereby leaving an aqueous salt solution derived from the mineral base having diminished nitrogen content.

3,996,226

COMPOUNDS FOR GIVING FABRICS NON-STAIN PROPERTIES

Dimitri Savostianoff, Asnieres, and Denise Dubos, Paris, both of France, assignors to Nobel Hoechst Chimie, Hauts-de-Seine, France

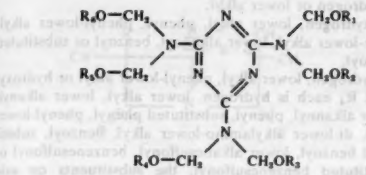
Division of Ser. No. 328,061, Jan. 30, 1973, Pat. No. 3,927,024. This application Mar. 3, 1975, Ser. No. 555,036

Claims priority, application France, Feb. 1, 1972, 72.03355; Dec. 18, 1972, 72.45091

Int. Cl.² C07D *251/64*

U.S. Cl. 260—249.6 5 Claims

1. A compound of the formula:



wherein at least one of R_1, R_2, R_3, R_4, R_5 and R_6 is selected from the group consisting of alkyl and alkanoyl radicals having at least 10 carbons and alkyl radicals having at least 2 carbons and at least one halogen substituent; at least one of R_1, R_2, R_3, R_4, R_5 and R_6 is the radical resulting from the removal of a hydroxyl from the alcohol group of the addition product of 5 to 30 molecules of identical or different alkylene oxides on an alcohol or an acid; and the other remaining R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen or a lower alkanoyl or alkyl radical having less than 4 carbons.

3,996,227

7-METHYL-1-ISOPROPYL-4-PHENYL-5,6,7,8-TETRAHYDRO-2(1H)-QUINAZOLINONE

William G. Salmond, Mount Arlington, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 160,960, July 8, 1971, abandoned. This application June 19, 1974, Ser. No. 480,625

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *239/82*

U.S. Cl. 260—251 A **1 Claim**

1. The compound which is 7-methyl-1-isopropyl-4-phenyl-5,6,7,8-tetrahydro-2(1H)-quinazolinone.

3,996,228

PYRIMIDINOAMINOETHYL ERGOLINE DERIVATIVES

Giuliana Arcari; Luigi Bernardi; Germano Bosisio; Alfredo Glasser, and Aldemio Temperilli, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

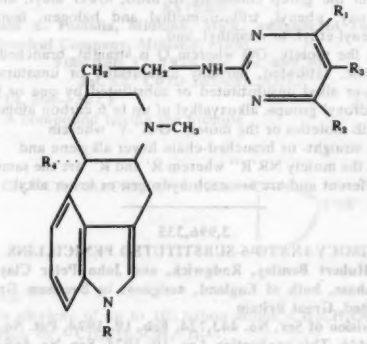
Filed Dec. 9, 1974, Ser. No. 530,617

Claims priority, application Italy, Dec. 21, 1973, 54532/73

Int. Cl.² C07D *457/02*

U.S. Cl. 260—256.4 C **16 Claims**

1. A compound having the formula:



wherein R is hydrogen or methyl; R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl having 1 to 3 carbon atoms, methoxy and phenyl; R_3 is hydrogen, halogen, alkyl having 1 to 3 carbon atoms, alkoxy having 1 to 3 carbon atoms, phenyl, cyano, nitro, amino, acylamino, wherein the acid residue is derived from a monocarboxylic acid having 1 to 3 carbon atoms, carboxamido having 1 to 3 carbon atoms, carbalkoxy having 2 to 4 carbon atoms, trifluoromethyl or $-SO_2-Y$ wherein Y is hydroxyl, amino or methyl; and R_4 is hydrogen or methoxy.

3,996,229

1-[10,11-DIHYDRO-DIBENZO[b, f]-THIEPIN-10-YL]-4-(ALKYNYLALKYL)-PIPERAZINES

Max Gerecke, Reinach, Switzerland; Jean-Pierre Kaplan, Les Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 8, 1975, Ser. No. 539,374

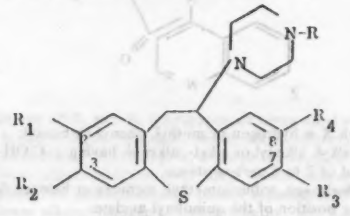
Claims priority, application Switzerland, Jan. 14, 1974, 449/74; Nov. 15, 1974, 15249/74

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07D *295/10, 295/12*

U.S. Cl. 260—268 TR **4 Claims**

1. A compound of the formula



wherein R is lower alkynylalkyl, hydroxy-lower alkylalkynylalkyl or alkanoyloxy-lower alkylalkynylalkyl, and one of the two symbols R_1 and R_2 or R_3 and R_4 is hydrogen and the other is halogen, methyl, methoxy, methylthio, trifluoromethyl, methanesulfonyl or dimethylsulfamoyl,

or a pharmaceutically acceptable acid addition salt thereof.

3,996,230

1-PIPERAZINO-6-(2-PYRIDYL)-4H-s-TRIAZOLO[4,3-a] [1,4]BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

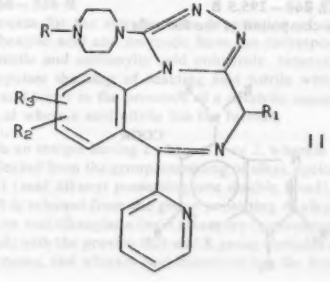
Filed Mar. 28, 1975, Ser. No. 563,070

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.³ C07D *295/12*

U.S. Cl. 260—268 TR **8 Claims**

1. A compound of the formula II:



wherein R is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, or β-hydroxyethyl; wherein R_1 is hydrogen or alkyl defined as above; and wherein R_2 and R_3 are hydrogen, alkyl as definend above, fluoro, chloro, bromo, nitro, or trifluoromethyl, or the pharmacologically acceptable acid addition salts thereof.

3,996,231

1-QUINOLINYL-PYRAZOLIDINE DERIVATIVES

Camille Georges Wermuth, Strasbourg, and Jean Choay, Paris, both of France, assignors to Choay S.A., Paris, France

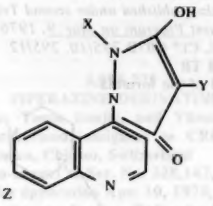
Filed July 11, 1974, Ser. No. 487,536

Claims priority, application France, July 13, 1973, 73.25857

Int. Cl.² C07D *401/04*

U.S. Cl. 260—288 CE **20 Claims**

1. A compound of the formula



(I)

in which X is hydrogen or methyl, phenyl or benzyl;

Y is alkyl, alkenyl or alkyl-, alkenyl- having a -C:OH group and of 2 to 6 carbon atoms;

Z is hydrogen, trifluoromethyl, methoxy or halogen fixed at any position of the quinolinyl nucleus.

3,996,232

1,5-DISUBSTITUTED BIGUANIDES

Julius Diamond, Morris Plains, N.J., and Bernard J. Burns, Philadelphia, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 92,256, Nov. 23, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,243

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C07D *295/14*

U.S. Cl. 260—293.79 **21 Claims**

1. 1-(p-trifluoromethoxyphenyl)-5-i-propylbiguanide.

3,996,233

AMINO DERIVATIVES OF IMIDAZO[4,5-b]PYRIDINES

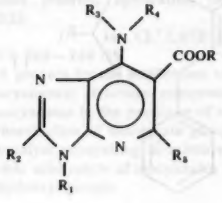
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 10, 1975, Ser. No. 548,325

Int. Cl.² C07D *401/04, 471/02*

U.S. Cl. 260—295.5 B **17 Claims**

1. A compound of the formula



wherein

R is hydrogen or lower alkyl;

R_1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, cyclo-lower alkyl, lower alkanoyl, benzoyl or substituted benzoyl;

R_2 is hydrogen, lower alkyl, phenyl-lower alkyl or hydroxy;

R_3 and R_4 each is hydrogen, lower alkyl, lower alkenyl, lower alkanoyl, phenyl, substituted phenyl, phenyl-lower alkyl, di-lower alkylamino-lower alkyl, benzoyl, substituted benzoyl, lower alkanesulfonyl, benzenesulfonyl or substituted benzenesulfonyl; the substituents on said foregoing substituted radicals being lower alkyl, halogen, trifluoromethyl, amino or carboxy; or R_3 and R_4 together with the nitrogen form pyrrolidino;

R_5 is hydrogen, lower alkyl, phenyl or substituted phenyl, the substituents on said substituted phenyl being halogen, lower alkyl, amino, trifluoromethyl or carboxy; and physiologically acceptable salts thereof.

3,996,234

1,4-DIHYDROPYRIDINE CARBOXYLIC ACID ESTERS

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

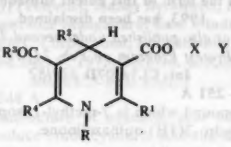
Division of Ser. No. 350,381, April 12, 1973. This application Feb. 10, 1975, Ser. No. 548,394

Claims priority, application Germany, Apr. 18, 1972, 2218644

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, straight- or branched-chain lower alkyl, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms;

R^1 and R^4 are the same or different and are each hydrogen or straight- or branched-chain lower alkyl;

X is straight- or branched-chain lower alkylene;

Y is the moiety NR′R″ wherein R′ and R″ are the same or different and are each hydrogen or lower alkyl;

R^2 is phenyl substituted by 1, 2 or 3 substituents selected from the group consisting of nitro, lower alkyl, lower alkoxy, phenyl, trifluoromethyl and halogen; benzyl; phenyl-ethyl; or naphthyl; and

R^3 is the moiety -OQ wherein Q is straight, branched or cyclic, saturated, partially unsaturated or unsaturated lower alkyl unsubstituted or substituted by one or two hydroxyl groups, alkoxyalkyl of up to 6 carbon atoms in both moieties or the moiety -O-X′-Y′ wherein

X′ is straight- or branched-chain lower alkylene and

Y′ is the moiety NR′R″ wherein R′ and R″ are the same or different and are are each hydrogen or lower alkyl.

3,996,235

6-ISOCYANATO-6-SUBSTITUTED PENICILLINS

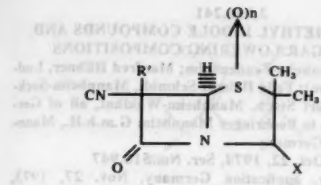
Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, Great Britain

Division of Ser. No. 443,724, Feb. 19, 1974, Pat. No. 3,936,446. This application Apr. 10, 1975, Ser. No. 566,695

Int. Cl.² C07D *499/00*

U.S. Cl. 260—306.7 C **5 Claims**

1. A compound of formula (VII):



(VII)

wherein *n* is zero or 1, X is a carboxylic acid group, or a non-toxic salt; or a conventional carboxylic acid ester readily hydrolysable to the parent acid, and R′ is alkylthio.

3,996,236
METHOXYMETHYL D-6-(2,2-DIMETHYL-5-OXO-4-PHENYL-1-IMIDAZOLIDINYL)PENICILLANATE

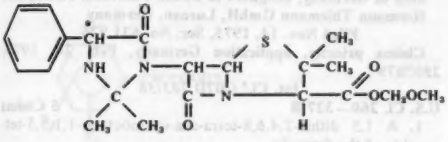
Paul D. Sleezer, Dewitt, and David A. Johnson, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 341,196, March 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 180,070, Sept. 13, 1971, abandoned. This application Feb. 18, 1975, Ser. No. 550,317

Int. Cl.² C07D *499/02*

U.S. Cl. 260—306.7 C **2 Claims**

1. The compound of the formula



having the D- configuration at the carbon atom marked with an asterisk.

3,996,237
OXAZOLINE- OR OXAZINE-SUBSTITUTED ACRYLIC ESTERS

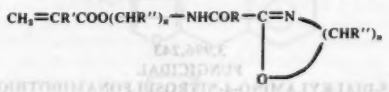
Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 17, 1974, Ser. No. 489,302

Int. Cl.² C07D *265/08, 263/12*

U.S. Cl. 260—307 F **2 Claims**

1. A compound having the formula



wherein

R is alkylene of up to 10 carbon atoms, $CH_2CH_2OCH_2CH_2$— or —$CH_2CH_2SCH_2CH_2$—,

R′ is hydrogen or CH_3,

R″ is hydrogen and

n is the integer 2.

3,996,238
4- OR 5-NITROIMIDAZOLES AND PROCESSES FOR THEIR MANUFACTURE

Atso Ilvespää, Neuallschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 328,816, Jan. 31, 1973, Pat. No. 3,914,248. This application Nov. 11, 1974, Ser. No. 522,567

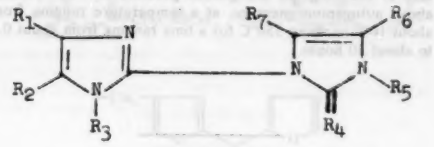
Claims priority, application Switzerland, Feb. 8, 1972, 1810/72

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.2 **4 Claims**

1. An imidazole compound of the formula



wherein one of R_1 and R_2 is hydrogen or lower alkyl and the other is nitro, R_3 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl R_4 is oxo or thioxo, R_5 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, phenyl or monosubstituted phenyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, and R_6 and R_7 conjointly form the missing part of a fused benzene nucleus or a benzene nucleus substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl or a nitro group, and the S-oxides, sulfones, N-oxides or acid addition salts thereof.

3,996,239
CONVERSION OF ALIPHATIC NITRILES TO CARBOXYLIC ACIDS USING CYCLIC ACID ANHYDRIDES

Stanley D. Turk, and Charles A. Drake, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 17, 1973, Ser. No. 398,084

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

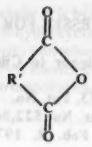
Int. Cl.² C07D *209/48, 209/52*

U.S. Cl. 260—326 R **4 Claims**

1. A process for the simultaneous preparation of an aliphatic carboxylic acid and an imide from the corresponding aliphatic nitrile and carboxylic acid anhydride, respectively, which comprises the step of reacting said nitrile with said anhydride and water in the presence of a catalytic amount of a strong acid wherein said nitrile has the formula

$$R(CN)_n$$

wherein *n* is an integer having a value of 1 or 2, wherein for *n* = 1, R is selected from the group consisting of alkyl, cycloalkyl and alkenyl (said alkenyl possessing one double bond), and for *n* = 2, R is selected from the group consisting of alkylene, cycloalkylene and alkenylene (said alkenylene possessing one double bond) with the proviso that said R group contains up to 13 carbon atoms; and wherein said anhydride has the formula



wherein R′ is selected from the group consisting of arylene groups having 6 or 10 carbon atoms, alkarylene groups having from 7 to 12 carbon atoms and cycloalkylene groups having from 6 to 12 carbon atoms, wherein the carbon atoms of the anhydride group are bonded to adjacent carbon atoms of the ring structure; wherein said reaction is conducted at a pressure in the range of autogenous pressure to 5000 pounds above autogenous pressure, at a temperature ranging from about 100° to about 350°C for a time ranging from about 0.5 to about 20 hours.

3,996,240

HALOGENATED ALKENYL SUCCINIC ANHYDRIDE-AMINE REACTION PRODUCT

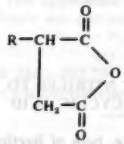
William P. Cullen, Fishkill, and Harry Chaletz, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 377,473, July 9, 1973, Pat. No. 3,864,269. This application Sept. 9, 1974, Ser. No. 504,639

Int. Cl.² C07D 209/32

U.S. Cl. 260—326.5 F **8 Claims**

1. A method of preparing a halogenated alkenyl succinic anhydride-alkylene polyamine reaction product comprising reacting in the absence of hydroxylic and solvent compounds an alkenyl succinic anhydride characterized by the formula:



where R is a monoolefinic, monovalent polyalkene radical of from 30 to 300 carbons with a halogen selected from the group consisting of chlorine and bromine at a temperature between about 50° and 150° C. utilizing a mole ratio of alkenyl succinic anhydride to said halogen of between about 1:0.5 and 1:2 to form a monohaloalkenyl succinic anhydride containing intermediate, contacting in the absence of hydroxylic and solvent compounds said intermediate with an alkylene polyamine of the formula:

$$H_2N(CH_2)_z[NH(CH_2)_yNH]_x(CH_2)_zNH_2$$

where x is an integer of from 1 to 6, y is an integer from 2 to 6 and z is an integer from 0 to 4 at a temperature between about 100° and 200° C. utilizing a mole ratio of said intermediate to alkylene polyamine of between about 1:1 and 1:10 to form said halogenated alkenyl succinic anhydride-alkylene polyamine reaction product.

3,996,241

2-HYDROXYMETHYL INDOLE COMPOUNDS AND BLOOD SUGAR LOWERING COMPOSITIONS

Ruth Heerdt, Mannheim-Feudenheim; Manfred Hübner, Ludwigshafen (Rhine); Felix Helmut Schmidt, Mannheim-Seckenheim, and Kurt Stach, Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

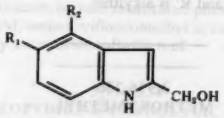
Filed Oct. 22, 1974, Ser. No. 516,947

Claims priority, application Germany, Nov. 27, 1973, 2358973

Int. Cl.² C07D 209/12

U.S. Cl. 260—326.16 **16 Claims**

1. Indole compound of the formula



(I)

wherein

R_1 is hydrogen, halogen, lower alkyl or lower alkoxy

R_2 is hydrogen, halogen, or lower alkyl with the proviso that R_1 and R_2 be not both hydrogen, and wherein, when R_1 is alkoxy, R_2 is halogen or alkyl; and

R_1 and R_2 taken together, represent a —CH=CH-CH=CH— bridge.

3,996,242

DITHIA-TETRAAZACYCLOOCTANE-TETRAOXIDES

Jürgen Dusemund, Berlin, and Paul Richard Bock, Muenster, both of Germany, assignors to Chem. Pharmaz. Fabrik Dr. Hermann Thiemann GmbH, Luenen, Germany

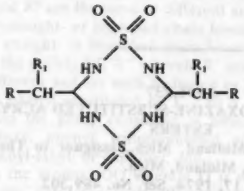
Filed Nov. 14, 1975, Ser. No. 631,926

Claims priority, application Germany, Feb. 24, 1975, 2507879

Int. Cl.² C07D 285/38

U.S. Cl. 260—327 R **5 Claims**

1. A 1,5 dithia-2,4,6,8-tetra-aza-cyclooctane-1,1,5,5-tetraoxide of the formula:



(I)

wherein

R is a halogen atom,

R_1 is selected from the group consisting of hydrogen and chlorine in which latter case R is also chlorine.

3,996,243

FUNGICIDAL 5-DIALKYLAMINO-4-NITROSULFONAMIDOTHIOPHENES

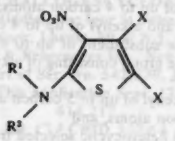
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 19, 1975, Ser. No. 578,851

Int. Cl.² C07D 333/00

U.S. Cl. 260—329 S **9 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms; R^2 is alkyl of 1 to 6 carbon atoms; one X is hydrogen, fluoro, chloro or bromo and the other X is $-SO_2N(R^3)$ (R^4) wherein R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, nitro or alkyl of 1 to 3 carbon atoms and R^4 is haloalkylthio of 1 to 3 carbon atoms and 1 to 7 of the same or different halogens selected from fluoro, chloro or bromo.

3,996,244

INSECTICIDAL ESTERS OF SUBSTITUTED FURAN METHANOL

Keimei Fujimoto, Kobe; Nobuo Ohno; Yoshitoshi Okuno, both of Toyonaka; Toshio Mizutani, Toyonaka; Isao Ohno, Minoo; Masachika Hirano, Toyonaka; Nobushige Itaya, Ikeda, and Takashi Matsuo, Amagasaki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

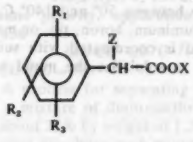
Filed July 11, 1973, Ser. No. 378,301

Claims priority, application Japan, July 11, 1972, 47-69805; Apr. 19, 1973, 48-44809

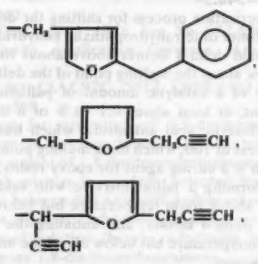
Int. Cl.² C07D *317/54*

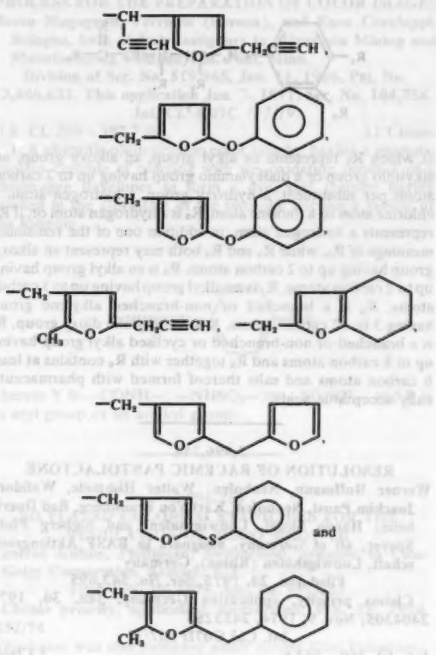
U.S. Cl. 260—332.2 A **11 Claims**

1. A compound of the formula



wherein R_1 is a member selected from the group consisting of hydrogen, methoxy, methylsulfinyl, allyl, methylthio, trifluoromethyl, nitro, methoxycarbonyl, ethoxy, methyl, chlorine, propyl, butyl, bromine, fluorine, iodine, ethyl, ethoxycarbonyl or methoxymethyl; R_2 is a member selected from the group consisting of hydrogen, methyl, methoxy, chlorine or bromine, or R_1 and R_2 are attached to adjacent carbon atoms and are bonded to one another to form methylenedioxy or tetramethylene; R_3 is hydrogen or methyl; Z is a member selected from the group consisting of methyl, ethyl, propyl, butyl, isopropenyl, cyclopropylmethyl, bromoethyl, cyclohexyl, propargyl or trifluoromethyl and X is a member selected from the group consisting of:





and

3,996,245

SPASMOLYTICS

Jan Hartog, and Johannes Maria Antonius Zwagemakers, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

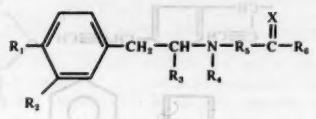
Filed Apr. 3, 1975, Ser. No. 564,777

Claims priority, application Netherlands, Apr. 8, 1974, 7404733

Int. Cl.² C07D *317/10*

U.S. Cl. 260—340.9 **11 Claims**

1. Compounds of the formula



in which R_1 represents an alkyl group, an alkoxy group, an alkylthio group or a dialkylamino group having up to 2 carbon atoms per substituent, a hydroxy group, a hydrogen atom, a chlorine atom or a fluorine atom, R_2 is a hydrogen atom or, if R_1 represents a hydrogen atom, in addition one of the remaining meanings of R_1, while R_1 and R_2 both may represent an alkoxy group having up to 2 carbon atoms, R_3 is an alkyl group having up to 2 carbon atoms, R_4 is an alkyl group having up to 3 carbon atoms, R_5 is a branched or non-branched alkylene group having 3 to 12 carbon atoms, X is an ethylene dioxy group, R_6 is a branched or non-branched or cyclised alkyl group having up to 8 carbon atoms and R_5 together with R_6 contains at least 6 carbon atoms and salts thereof formed with pharmaceutically acceptable acids.

3,996,246

RESOLUTION OF RACEMIC PANTOLACTONE

Werner Hoffmann, Neuhofen; Walter Himmele, Walldorf; Joachim Paust, Neuhofen; Karl Von Fraunberg, Bad Duerkheim; Hardo Siegel, Ludwigshafen, and Sigberg Pfohl, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 24, 1975, Ser. No. 543,695

Claims priority, application Germany, Jan. 30, 1974, 2404305; Nov. 9, 1974, 2453283

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **2 Claims**

1. A process for resolving racemic pantolactone which comprises adding (−)-3-aminomethylpinane or (+)-3-aminomethylpinane or any one of their acid addition salts to a solution of an alkali metal salt of D,L-pantoic acid at temperatures from 0° to 90° C, separating the precipitated crystalline diastereomeric salt, resolving the diastereomeric salt of the D-pantoic acid with alkali metal hydroxide, separating the (+)-or (−)-3-aminomethylpinane and regenerating the D-pantolactone with an acid.

3,996,247

SUBSTITUTED 4-AMINOPHENYLAMIDINES

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

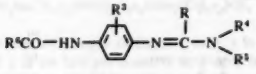
Division of Ser. No. 398,692, Sept. 19, 1973, Pat No. 3,911,010, which is a division of Ser. No. 151,581, June 9, 1971, Pat. No. 3,818,070. This application Apr. 21, 1975, Ser. No. 569,923

Claims priority, application Germany, June 13, 1970, 2029298

Int. Cl.² C07D *309/08*

U.S. Cl. 260—345.7 **6 Claims**

1. A compound selected from the group consisting of an aminophenylamidine and the physiologically acceptable acid addition salts thereof, said aminophenylamidine having the formula:



wherein

R is alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

R^3 is hydrogen, chloro, fluoro, bromo, cyano, trifluoromethyl, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms and alkenyl of up to 4 carbon atoms;

R^4 is an aliphatic substituent of up to 4 carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl and alkoxy;

R^5 is alkyl or alkenyl of up to 5 carbon atoms or cycloalkyl of 3 to 7 carbon atoms, and

R^6 is a saturated heterocyclic selected from the group consisting of tetrahydrofuryl, tetrahydrofurfuryl and tetrahydropyranyl, said saturated heterocyclic being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms.

3,996,248

PREPARATION OF 2,5-DIHYDROFURANS FROM BUTADIENE MONOXIDES

Robert G. Wall, Pinole, and Victor P. Kurkov, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1975, Ser. No. 632,555

Int. Cl.² C07D *307/28*

U.S. Cl. 260—346.1 R **7 Claims**

1. A process for preparing a substituted or unsubstituted 2,5 dihydrofuran from a substituted or unsubstituted butadiene monoxide which comprises contacting the butadiene monoxide with a catalyst comprising a hydrogen halide selected from the group consisting of hydrogen iodide or bromide and a homogeneous metal compound in an inert organic solvent under liquid phase reaction conditions effective to convert the butadiene monoxide to the dihydrofuran, said reaction conditions including a temperature between 50° and 140° C, and wherein said metal is zinc, aluminum, boron, tin, or magnesium, and wherein the metal is coordinated with suitable organic or inorganic ligands to solubilize the metal in the organic solvent.

3,996,249

ISOMERIZATION PROCESS

Ben B. Corson, Milwaukee, Wis., and William T. Gormley, Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 123,075, March 10, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,798

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.3 **11 Claims**

1. An isomerization process for shifting the double bond of the delta-4 isomer of tetrahydrophthalic anhydride comprising isomerizing said delta-4 isomer above about room temperature but below about the melting point of the delta-4 isomer in the presence of a catalytic amount of palladium and, in a minor amount, at least about 0.1 wt.% of a liquid or solid second dicarboxylic acid anhydride, which has a molecular weight in excess of 100, which has a melting point below about 140°C, which is a curing agent for epoxy resins, and which is capable of forming a liquid mixture with said isomer at a temperature above room temperature but below the melting point of the delta-4 isomer, and initiating the isomerization above room temperature but below about the melting point of the delta-4 isomer.

3,996,250

3-FURYL BETA-CHALCOGENCYCLOALKYL SULFIDES

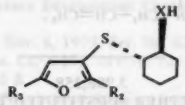
William J. Evers, Middletown; Igor A. Pelse, Long Branch, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 542,830, Jan. 21, 1975, Pat. No. 3,933,863. This application Sept. 17, 1975, Ser. No. 614,217

Int. Cl.² C07D *307/64*

U.S. Cl. 260—347.2 7 Claims

1. A 3-furyl beta-chalcogencycloalkyl sulfide having the structure:



wherein X is a chalcogen selected from the group consisting of oxygen and sulfur; and R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 or R_3 being methyl, X and S being in a "trans" relationship to one another.

3,996,251

PREPARATION OF PURE 1,5-DINITROANTHRAQUINONE

Bernd Schroeder, Odenthal; Wolfgang Auge; Karl-Werner Thiem, both of Cologne, and Rutger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1976, Ser. No. 672,688

Claims priority, application Germany, Apr. 19, 1975, 2517436

Int. Cl.² C07C *79/37*; C09B *1/00*

U.S. Cl. 260—369 10 Claims

1. A process for separating off 1,5-dinitroanthraquinone from a mixture of dinitroanthraquinones which contains at least about 35% by weight of 1,5-dinitroanthraquinone, which comprises dissolving such mixture at elevated temperature in a solvent selected from the group consisting of a halogenated aromatic hydrocarbon, a nitrile of an aromatic or aliphatic carboxylic acid and a cyclic sulphone, cooling the solution thereby selectively precipitating the 1,5-dinitroanthraquinone, and separating the precipitated 1,5-dinitroanthraquinone from the solution.

3,996,252

PREPARATION OF PURE 1,8-DINITROANTHRAQUINONE

Bernd Schroeder, Odenthal; Wolfgang Auge; Karl-Werner Thiem, both of Cologne, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1976, Ser. No. 672,690

Claims priority, application Germany, Apr. 19, 1975, 2517435

Int. Cl.² C07C *79/37*; C09B *1/00*

U.S. Cl. 260—369 11 Claims

1. A process for separating off 1,8-dinitroanthraquinone from a mixture of dinitroanthraquinones containing at least about 70% by weight of 1,8-dinitroanthraquinone, comprising dissolving such mixture in a solvent selected from the group consisting of a halogenated aromatic hydrocarbon, a nitrile of an aromatic or aliphatic carboxylic acid and a cyclic sulphone, and cooling said solution thereby selectively to precipitate substantially pure 1,8-dinitroanthraquinone.

3,996,253

PROCESS FOR THE PREPARATION OF COLOR IMAGES

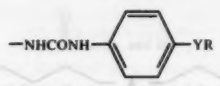
Remo Magagnoli, Ferrania (Savona), and Enzo Coraluppi, Bologna, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 519,965, Jan. 11, 1966, Pat. No. 3,446,622. This application Jan. 7, 1971, Ser. No. 104,754

Int. Cl.² C07C *127/19*

U.S. Cl. 260—397.7 D 12 Claims

1. A phenolic photographic color coupler having a phenolic nucleus capable of reacting with the oxidation product of a chromogen developer to form a dye, said coupler having bonded in the 2-position of the phenolic nucleus a radical of the formula



wherein Y is —CONH—, —$NHSO_2$— or —SO_2NH— and R is an aryl group or an aralkyl group.

3,996,254

SILYLATED CHLOROACETANILIDES FOR THE REGULATION OF PLANT GROWTH

Manfred Kühne, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,463

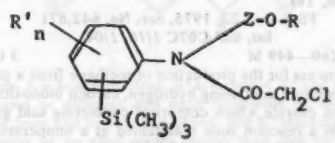
Claims priority, application Switzerland, Feb. 25, 1974, 2632/74

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C07F *7/10*, *7/18*

U.S. Cl. 260—448.2 N 9 Claims

1. Silylated chloroacetanilides of formula I



(I)

wherein

R represents a lower alkyl group having at most 4 carbon atoms, a group —CH_2—CH_2—$Si(CH_3)_3$, a group —CH_2—$Si(CH_3)_3$ or a trimethylsilyl group,

Z represents a straight or branched alkylene chain having at most 3 carbon atoms,

R′ represents halogen, lower alkyl or alkoxy having at most 3 carbon atoms or trimethylsilyl, and

n represents the number 0 or 1.

3,996,255

TOTAL SYNTHESIS OF 11-DEOXY-15-SUBSTITUTED PROSTAGLANDINS

Donald P. Strike, St. Davids, and Wenling Kao, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 463,482, April 24, 1974, abandoned. This application July 7, 1975, Ser. No. 593,821

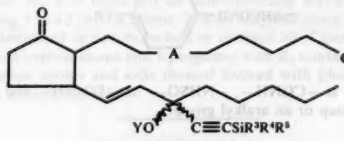
Int. Cl.² C07F *7/08*, *7/18*

U.S. Cl. 260—448.8 R 13 Claims

1. A compound of the formula:

wherein R is lower alkyl of from 1 to 4 carbon atoms; R^1 and R^2 are independently selected from among the group consisting of straight chain lower alkyl of from 1 to 4 carbon atoms; and X is —H or $SiR^3R^4R^5$ wherein R^3 is lower alkyl of from 1 to 4 carbon atoms and R^4 and R^5 are independently selected from among the group consisting of straight chain lower alkyl of from 1 to 4 carbon atoms.

6. A compound of the formula:



wherein A is a triple bond, a single bond, or a cis double bond; Y is —H or $—SiRR^1R^2$ wherein R is lower alkyl of from 1 to 4 carbon atoms, and R^1 and R^2 are independently selected from the group consisting of straight chain lower alkyl of from 1 to 4 carbon atoms; R^3 is lower alkyl; R^4 and R^5 are independently selected from among the group consisting of straight chain lower alkyl of from 1 to 4 carbon atoms; and R^6 is lower alkyl.

3,996,256

METHANATION CATALYST

Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1975, Ser. No. 642,871
Int. Cl.² C07C 1/16, 1/04
U.S. Cl. 260—449 M 3 Claims

1. A process for the production of methane from a gaseous reactant mixture containing hydrogen, carbon monoxide and/or carbon dioxide which comprises contacting said gaseous mixture in a reaction zone maintained at a temperature between about 300° C and about 700° C with a catalyst comprising molybdenum disilicide.

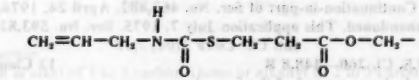
3,996,257

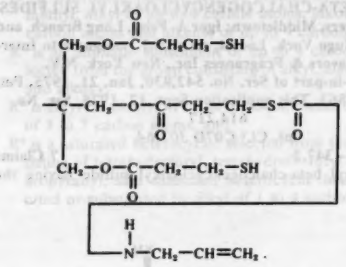
POLYTHIOCARBAMATE MONOMERS

Donald W. Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 504,410, Sept. 9, 1974, Pat. No. 3,966,794, which is a continuation of Ser. No. 259,148, June 2, 1972, abandoned. This application Apr. 16, 1976, Ser. No. 677,649
Int. Cl.² C07C 155/02
U.S. Cl. 260—455 A 2 Claims

1. A compound having the formula





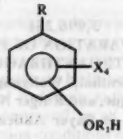
3,996,258

ALCOHOL-ETHER SUBSTITUTED TETRAHALO BENZONITRILES

Lewis Watts, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,270
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 F 3 Claims

1. A compound of the formula



where R is cyano, X is halo, and R_1 is $—CH_2CH_2O—_y$ where y is 1–3 or R_2O where R_2 is a straight or branched chain alkylene radical containing 2–6 carbon atoms.

3,996,259

OXIDATION OF ORGANIC COMPOUNDS BY AQUEOUS HYPOHALITES USING PHASE TRANSFER CATALYSIS

George A. Lee, Wayland, and Harold H. Freedman, Newton Center, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1975, Ser. No. 629,338
Int. Cl.² C07C 47/54, 49/76, 120/00, 120/10
U.S. Cl. 260—465 B 13 Claims

1. A process for oxidizing an organic compound selected from the group consisting of amines, amides, alkanals, primary and secondary alkanols, and organic compounds containing an activated double bond with aqueous hypohalite ion comprising reacting by contacting:

a. a water-immiscible, liquid organic phase comprising the organic compound; with

b. an aqueous phase containing hypohalite ion; and

c. a catalytic amount of a quaternary ammonium salt and/or a quaternary phosphonium salt.

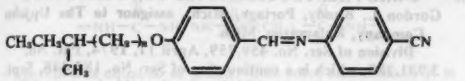
3,996,260

ALKOXYBENZYLIDENE-AMINOBENZONITRILES

Chan Soo Oh, Fullerton, Calif., and Edward Francis Pasierb, Hamilton Square, N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 407,546, Oct. 18, 1973, Pat. No. 3,923,685, which is a division of Ser. No. 298,339, Oct. 17, 1972, Pat. No. 3,792,915. This application Sept. 8, 1975, Ser. No. 611,552
Int. Cl.² C07C 121/80
U.S. Cl. 260—465 E 3 Claims

1. An optically active compound of the formula



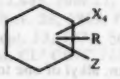
wherein *n* is an integer of from 1–5.

3,996,261
CYANOPOLYHALOANILINES

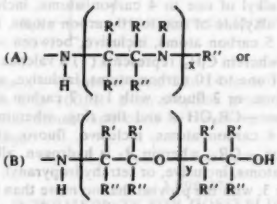
Lewis W. Watts, Jr., and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,343
Int. Cl.² C07C *121/78, 121/80*
U.S. Cl. 260—465 E **5 Claims**

1. A polyhalo, N-substituted aniline compound having the structural formula



where R is cyano, X is halo, and Z is a radical represented by



where R′ and R″ are hydrogen or lower alkyl, *x* is an integer ranging from 1 to 5 and *y* is a number of 0–3.

3,996,262
METHOD OF PROMOTING THE REACTION OF UNSATURATED NITRILES WITH OLEFINS TO PRODUCE UNSATURATED NITRILES OF INCREASED CARBON NUMBER

Stanley D. Turk, and Charles A. Drake, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 210,228, Dec. 20, 1971, abandoned. This application Apr. 1, 1974, Ser. No. 456,900
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.9 **10 Claims**

1. A method which comprises reacting under suitable reaction conditions at least one olefinic hydrocarbon compound with at least one unsaturated nitrile reactant in the presence of, as the sole reaction promoting material, a promoter consisting essentially of at least one organo derivative of a Group VA element, said reaction conditions being suitable for the reaction of said at least one olefinic hydrocarbon compound with said at least one unsaturated nitrile reactant to produce at least one unsaturated nitrile product having a greater number of carbon atoms than said unsaturated nitrile reactant;

said at least one olefinic hydrocarbon compound having from 3 to 12 carbon atoms and being represented by the formula $R_2C{=}CR{-}CHR_2$, wherein each R is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

said at least one unsaturated nitrile reactant having from 3 to 18 carbon atoms and being represented by the formula $R'CH{=}CR'{-}CN$ wherein each R′ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

said organo derivative of a Group VA element being represented by the formula R''_nZH_{3-n} wherein each R″ is independently selected from the group consisting of aryl, alkaryl, cycloalkylaryl, araryl, aryloxy, alkaryloxy, and arylaryloxy; each R″ group containing from 6 to 12 carbon atoms; Z is selected from the group consisting of

N, P, As, Sb, and Bi;

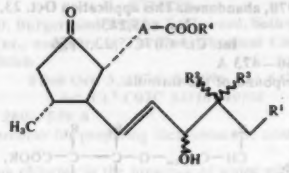
and *n* is selected from the integers 2 and 3.

3,996,263
9-OXO-11α-METHYL-15ξ-HYDROXYPROST-13(TRANS)-ENOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARAION THEREOF

Kiyoshi Sakai; Takashi Yusa; Junya Ide; Mitsuo Yamazaki, and Shinsaku Kobayashi, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed May 5, 1975, Ser. No. 574,376
Int. Cl.² C07C *177/00*
U.S. Cl. 260—468 D **4 Claims**

1. Prostanoic acid derivatives having the formula



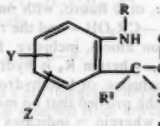
wherein A is hexamethylene, R^1 is n-propyl, R^2 and R^3 may be the same or different and each represents an alkyl group having from one to 4 carbon atoms, and R^4 represents hydrogen atom or an alkyl group having from one to 4 carbon atoms, and the pharmaceutically acceptable salts thereof.

3,996,264
SYNTHESIS OF OXINDOLES FROM ANILINES AND INTERMEDIATES THEREIN

Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 355,207, April 27, 1973, Pat. No. 3,897,451. This application Mar. 31, 1975, Ser. No. 563,783
Int. Cl.² C07C *149/40*
U.S. Cl. 260—470 **11 Claims**

1. A compound having a formula



(A)

wherein

R is hydrogen, a hydrocarbon radical free from aliphatic unsaturation and containing from 1 to 8 carbon atoms, or lower alkanoyl;
R^1 is lower alkyl, phenyl or benzyl;
R^2 hydrogen, lower alkyl, phenyl or benzyl;
R^3 is lower alkyl, phenyl or benzyl;
each of Y and Z is hydrogen or a subsitutent selected from the group consisting of halogen, nitro, lower alkyl, lower alkyloxy, lower acyloxy, a carbonyloxy-lower alkyl and carbonyloxy-phenyl.

3,996,265
PREPARATION OF N-ALKYL TEREPHTHALAMATES

James H. Walker, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 3, 1974, Ser. No. 529,152
Int. Cl.² C07C *102/06*
U.S. Cl. 260—471 R **5 Claims**

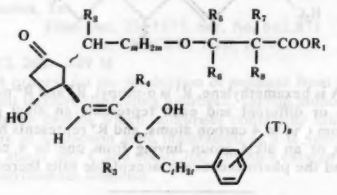
1. A process for preparing an N-alkyl terephthalamate which comprises contacting in a liquid phase reaction medium (1) di(C_1-C_4 alkyl) terephthalate and (2) a C_8 to C_{30} primary or secondary monoamine in the presence of 0.1 to 10 weight percent of boric acid based on the weight of said di(C_1-C_4 alkyl) terephthalate and said primary or secondary monoamine.

3,996,266
4-OXA PHENYL-SUBSTITUTED PGE COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 459,759, April 11, 1974, Pat. No. 3,931,289, which is a continuation of Ser. No. 185,448, Sept. 30, 1971, which is a continuation-in-part of Ser. No. 103,338, Dec. 31, 1970, abandoned. This application Oct. 23, 1975, Ser. No. 625,243
Int. Cl.² C07C *5/22, 9/76*
U.S. Cl. 260—473 A **28 Claims**

1. A compound of the formula:



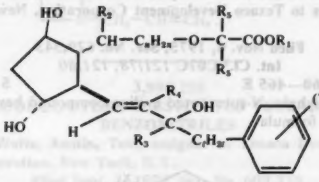
wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2 or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_mH_{2m} is alkylene of one to 9 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, between $-CHR_2-$ and $-O-$; wherein C_fH_{2f} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between $-CR_9OH-$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,996,267
3-OXO PHENYL-SUBSTITUTED PGF COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 459,759, April 11, 1974, Pat. No. 3,931,289, which is a continuation of Ser. No. 185,448, Sept. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 103,338, Dec. 31, 1970, abandoned. This application Oct. 23, 1975, Ser. No. 625,241
Int. Cl.² C07C *5/22, 69/76*
U.S. Cl. 260—473 A **37 Claims**

1. A compound of the formula:



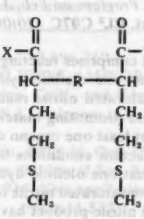
wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between $-CH-R_9-$ and $-O-$; wherein C_fH_{2f} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with 1 to 7 carbon atoms, inclusive, between $-CR_9OH-$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,996,268
CROSS-LINKING REAGENT FOR INSULIN SYNTHESIS

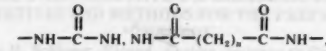
Frederick H. Carpenter, and Wolf-Dieter Busse, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sept. 3, 1974, Ser. No. 502,425
Int. Cl.² C07C *103/147, 103/183, 149/20*
U.S. Cl. 260—479 S **4 Claims**

1. A cross-linking reagent for use in peptide chains having the formula:



wherein R is selected from the group consisting of $-(CH_2)_n-$,



wherein n is equal to or greater than zero; and wherein X is (selected from the group consisting of an active ester, an acid halide, and an acid anhydride) selected from the group consisting of ortho-, meta-, and para-nitrophenyl ester.

4. A method for producing the cross-linking reagent carbonyl-bis (L-methionine nitrophenyl ester) comprising reacting methionine with phosgene at a reduced temperature and in basic reaction medium, acidifying the reaction mixture to yield a crystalline product, separating the cyrstalline product, reacting the crystalline product with dicyclohexylcarbodiimide and nitrophenol to produce the cross-linking reagent.

3,996,269
POLYURETHANE POLYMERS

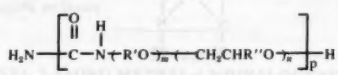
Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 372,445, June 21, 1973, which is a division of Ser. No. 880,892, Nov. 28, 1969, Pat. No. 3,763,106. This application Sept. 13, 1974, Ser. No. 505,726

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **4 Claims**

1. A linear polyurethane polymer characterized by the generalized formula



where n is an integer from 2 to 14, m is 0 or 1, p is an integer from 3 to 100, R′ is an alkylene group having from 3 to 5 carbon atoms, and each R″ is independently hydrogen or methyl.

3,996,270
INTERMEDIATE FOR GOSSYPLURE, THE SEX PHEROMONE OF THE PINK BOLLWORM

Lester Friedman, Cleveland, and Henry H. Chanan, Cleveland Heights, both of Ohio, assignors to Story Chemical Corporation, Muskegon, Mich.

Filed June 24, 1974, Ser. No. 482,760

Int. Cl.² C07C *69/145*

U.S. Cl. 260—488 H **1 Claim**

1. The compound (E)-11-hexadecen-7-ynyl acetate.

3,996,271
PROCESS FOR PRODUCING TEREPHTHALIC ACID BY CATALYTIC LIQUID PHASE OXIDATION OF PARA-XYLENE

Yoshiro Yokota, Ohtake, and Yoshiro Hisatomi, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,244

Claims priority, application Japan, May 15, 1973, 48-53185

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 R **4 Claims**

1. In a process for producing terephthalic acid by the catalytic liquid phase oxidation of para-xylene with either molecular oxygen or a gas containing molecular oxygen in the presence of acetic acid and a cobalt-containing catalyst at a temperature (T_1) of 150° to 250° C. and a pressure of 4 to 50 Kg/cm².G and recovering terephthalic acid from the liquid phase oxidation reaction product and directly recycling, without distillation, the catalyst-containing mother liquor remaining after recovery of terephthalic acid to the oxidation reaction zone, the improvement comprising

1. recovering terephthalic acid at a temperature (T_2) which satisfies the following equation

$$((T_1 - 150°)^{1.5}/150°) + 150° \leqq T_2 \leqq T_1$$

wherein (T_1) is the temperature of the above liquid phase oxidation,

2. recycling a part or whole of the catalyst-containing mother liquor remaining after the recovery of terephthalic acid without distillation to the catalytic liquid phase oxidation while maintaining it at a temperature (T_3) which satisfies the following equation

$$T_2 \leqq T_3 \leqq T_1$$

wherein (T_3) is the temperature employed in the recovery of terephthalic acid, and

3. passing the resulting gaseous oxidation reaction product through a fractionating zone in which the acetic acid vapor is condensed while the water vapor is not condensed, recycling the condensed acetic acid to the oxidation reaction zone, and removing the water vapor from the reaction system together with the non-condensable gas.

3,996,272
METHOD FOR PREPARING PENTACHLOROACETONE AND DICHLOROACETIC ACID FROM ISOPROPYL ETHERS

Joanne D. Burger, and William L. Howard, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1974, Ser. No. 511,842

Int. Cl.² C07C *53/16, 49/08*

U.S. Cl. 260—539 A **32 Claims**

1. A process for preparing dichloroacetic acid which comprises:

reacting chlorine in the presence of water with at least one isopropyl ether having the formula $C_3H_{(7-x)}Cl_x$—O—$C_3H_{(7-y)}Cl_y$ or the formula $C_3H_{(7-x)}Cl_x$—O—R, where x and y are integers independently selected from zero to five and R is selected from lower alkyl groups or chlorointed lower alkyl groups at a temperature of from about 25° to about 300°C. and a pressure of from about 0.5 to about 10 atmospheres to produce pentachloroacetone;

reacting the thus formed pentachloroacetone with a base-acting material selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates, and mixtures thereof, to produce a salt of dichloroacetic acid; and

reacting the thus produced salt of dichloroacetic acid with a mineral acid to produce dichloroacetic acid.

21. A process for the production of pentachloroacetone comprising reacting chlorine in the presence of water with at least one isopropyl ether having the formula

$$C_3H_{(7-x)}Cl_x—O—C_3H_{(7-y)}Cl_y$$

or the formula

$$C_3H_{(7-x)}Cl_x—O—R,$$

where x and y are integers independently selected from zero to five and R is selected from lower alkyl groups of chlorinated lower alkyl groups at a temperature of from about 25° to about 300° C and a pressure from about 0.5 to about 10 atmospheres.

3,996,273

MANUFACTURE OF PHOSGENE FROM CHLORINE OBTAINED BY OXIDATION OF HYDROCHLORIC GAS AND FIXED ON REACTIONAL CHLORINE EXCHANGER MASSES

Jean-Claude Daumas, Orsay, France, assignor to Rhone-Progil, Paris, France

Continuation of Ser. No. 445,539, Feb. 25, 1974, abandoned, which is a division of Ser. No. 268,750, July 3, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,144
Claims priority, application France, July 5, 1971, 71.24449
Int. Cl.² C07F 9/02
U.S. Cl. 260—544 K 3 Claims

1. The method for the preparation of phosgene comprising reacting hydrochloric acid gas, air and carbon monoxide in the presence of a reaction mass consisting essentially of a support containing copper chloride, potassium chloride, with or without a rare earth metal chloride, in which the support is formed of silica gel granules having a specific surface of less than 10 m²/g and a porous volume within the range of 0.3 to 1 cc/gram in which the amount of copper and rare earth metals are respectively within the range of 10–20% by weight copper and 0–4% by weight rare earth metals, the copper being present in the cupric state, the atomic ratio of K:Cu is within the range of 0.2–0.4, in which in a first phase the hydrochloric acid gas is oxidized in the presence of cuprous chloride to form cupric chloride and in which in a second phase the cupric chloride that is formed reacts with carbon monoxide to form phosgene.

3,996,274

METHOD FOR PRODUCING CHLOROBENZOYL CHLORIDE

Anthony T. Jurewicz, Kendall Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,288
Int. Cl.² C07C 51/58
U.S. Cl. 260—544 D 4 Claims

1. In a method for producing monochlorobenzoyl chloride the improvement wherein benzoyl chloride is chlorinated in the absence of a solvent and in the presence of an anhydrous ferric chloride-iodine cocatalyst system at a temperature of from about 0°–50° C. in which the concentration of the ferric chloride is from about 0.1–5 weight % based on the weight of the benzoyl chloride and the weight ratio of ferric chloride to iodine is from about 1–75.

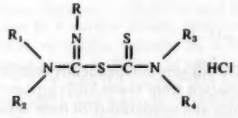
3,996,275

DITHIOCARBAMATE HYDROCHLORIDE SALTS AND THEIR MANUFACTURE

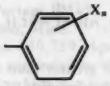
John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 567,050, April 10, 1975, Pat. No. 3,956,384, which is a division of Ser. No. 506,671, Sept. 16, 1974, Pat. No. 3,903,153, which is a division of Ser. No. 382,259, July 24, 1973, Pat. No. 3,860,634, which is a division of Ser. No. 160,556, July 7, 1971, abandoned. This application Jan. 21, 1976, Ser. No. 651,096
Int. Cl.² C07C 153/00
U.S. Cl. 260—545 R 6 Claims

1. A compound of the formula



wherein R is



wherein *n* is an integer of from 1 to 3 and X is lower alkyl-CO-NH-, R_1 and R_2 are each lower alkyl, lower alkenyl, lower alkynyl or benzyl having from 0 to 2 halo on the phenyl ring, and R_3 and R_4 are each lower alkyl or benzyl having from 0 to 1 halo on the phenyl ring.

3,996,276

BICYCLIC AND TRICYCLIC PHOSPHOROUS TRIAMIDES

Thomas Joseph Atkins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1975, Ser. No. 606,778
Int. Cl.² C07F 9/02, 9/22; C07D 255/00
U.S. Cl. 260—551 P 7 Claims

1. Polycyclic phosphorous triamides of the formula

in which

R^1 and R^2, alike or different, are alkylene of 2 to 6 carbons containing at least 2 carbons in the backbone, and

R^3 and R^4, alike or different, are alkyl of 1 to 8 carbons, cycloalkyl of 5 to 8 carbons, or aralkyl where the aryl group is of 6 to 12 carbons and the alkyl is of 1 to 8 carbons, or

R^3 and R^4 are joined together to form an alkylene radical of 2 to 6 carbons containing at least 2 carbons in the backbone,

and, when the triamide is tricyclic, at least one of the chains between the nitrogens linked to phosphorus contains at least three carbons in the backbone.

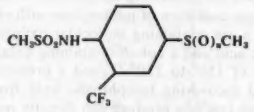
3,996,277

4-METHYLTHIO-2-TRIFLUOROMETHYLMETHANESULFONANILIDE AND DERIVATIVES THEREOF

Thomas L. Fridinger, Woodbury; George G. I. Moore, Birchwood, both of Minn., and Larry R. Lappi, Thousand Oaks, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1974, Ser. No. 523,673
Int. Cl.² C07C 143/75; A01N 9/16
U.S. Cl. 260—556 A 4 Claims

1. A compound of the formula



wherein *n* is zero, one or two and agriculturally acceptable salts thereof.

3,996,278

NOVEL 2-AMINOMETHYL-4-,6-DIHALOGENPHENOL DERIVATIVES AND METHODS FOR THE PREPARATION THEREOF

Ludwig H. Schlager, Vienna, Austria, assignor to Gerot-Pharmazeutika Dr. Walter Otto K.G., Vienna, Austria

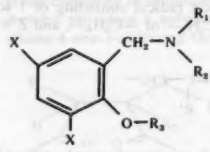
Filed Jan. 2, 1974, Ser. No. 429,984

Claims priority, application Austria, Jan. 2, 1973, 173/73; Aug. 24, 1973, 7387/73

Int. Cl.² C07C *103/32*

U.S. Cl. 260—559 R 16 Claims

1. A compound of the formula:



(I)

wherein X is the same halogen in both positions, R_1 is a hydrogen atom or a lower alkyl group, R_2 is an alkyl, cycloalkyl, aryl or aralkyl group, or R_1 and R_2 together with the nitrogen atom may form a saturated heterocyclic ring, which ring may be interrupted by an oxygen, nitrogen or sulfur atom, and R_3 is carboxylalkyl, carbamylalkyl, acyl, carbalkoxyalkyl, N,N-dialkylcarbamyl, N-alkylcarbamyl-alkyl or N,N-dialkylcarbamylalkyl group and salts thereof with physiologically acceptable acids or bases.

3,996,279

NOVEL 2-AMINO METHYL-4,6-DIHALOGENPHENOL DERIVATIVES AND METHODS FOR THE PREPARATION THEREOF

Ludwig H. Schlager, Vienna, Austria, assignor to Gerot-Pharmazeutika Dr. Walter Otto K.G., Vienna, Austria

Continuation-in-part of Ser. No. 429,984, Jan. 2, 1974. This application Oct. 31, 1974, Ser. No. 519,710

Claims priority, application Austria, Jan. 2, 1973, 1/73; Aug. 24, 1973, 7387/73; Denmark, June 10, 1974, 3097/74

Int. Cl.² C07C *103/32*

U.S. Cl. 260—559 R 2 Claims

1. N-[2-(N',N'-diethyl-carbamyl-methoxy)-3,5-dibromobenzyl]-tertiary butylamine.

3,996,280

POLYFLUOROALKOXY-SUBSTITUTED AROMATIC CARBOXYLIC AMIDES AND HYDROZIDES

Arthur Mendel, Vadnais Heights, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 349,237, April 9, 1973, Pat. No. 3,923,885, which is a division of Ser. No. 57,350, July 22, 1970, Pat. No. 3,766,247. This application Sept. 19, 1975, Ser. No. 614,905

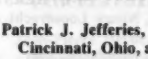
Int. Cl.² C07C *103/26*

U.S. Cl. 260—559 R 9 Claims

1. A compound of the formula

wherein X is amino, 2-chloroethylamine, 2-bromoethylamino or hydrazino, Ar is a benzene nucleus, each R_f is a fluorocarbon group consisting of a fluorinated alkyl group having no more than one hydrogen on any carbon atom therein and containing from 1 to 3 carbon atoms, provided that two carbon atoms in the R_f group can be linked together by an oxygen atom, and n is 2.

5. A compound of the formula



wherein X is amino, 2-chloroethylamino, 2-bromoethylamino or hydrazino, Ar is a naphthalene nucleus, each R_f is a fluorocarbon group consisting of a fluorinated alkyl group having no more than one hydrogen on any carbon atom therein and containing from 1 to 3 carbon atoms, provided that 2 carbon atoms in the R_f group can be linked together by an oxygen atom, and n is 1–3.

3,996,281

FLUORINATED CARBOXYLIC ACID AMIDES AND POLYMERIZATION PRODUCTS THEREOF

Helmut Huber-Emden, Basel, and Paul Schafer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

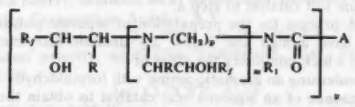
Filed Feb. 6, 1975, Ser. No. 547,530

Claims priority, application Switzerland, Feb. 12, 1974, 1927/74

Int. Cl.² C07C *103/133*

U.S. Cl. 260—561 N 26 Claims

1. Fluorinated carboxylic acid amides of the formula



wherein R_f is a perfluoroalkyl radical with 4 to 14 carbon atoms, R is hydrogen or methyl, R_1 is hydrogen or R_fCHOH-CHR—, if m is 1; and hydrogen, alkyl with 1 to 18 carbon atoms, cycloalkyl with 5 or 6 carbon atoms, hydroxylalkyl with 2 to 6 carbon atoms, alkoxyalkyl with 1 to 4 carbon atoms in the alkoxy moiety or $R_fCHOHCHR$—, if m is 0, A is an ethylenically unsaturated hydrocarbon radical with 2 or 3 carbon atoms, m is 0 or 1, y is 1 or 2 and p is an integer from 2 to 6.

3,996,282

WATER-SOLUBLE QUATERNARY AMMONIUM DYESTUFFS

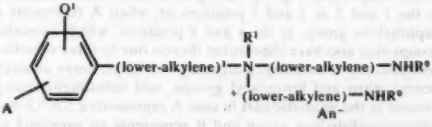
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 51,690, July 1, 1970, Pat. No. 3,839,426, which is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 551,868, May 23, 1966, abandoned, and Ser. No. 332,511, Feb. 14, 1973, Pat. No. 3,935,182, which is a continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, July 1, 1970, Pat. No. 3,709,903, which is a continuation-in-part of said Ser. No. 777,884. This application July 5, 1974, Ser. No. 486,180

Int. Cl.² C07C *87/30*

U.S. Cl. 260—567.6 M 2 Claims

1. A compound having the formula



wherein A is nitro or amino; Q^1 is hydrogen, lower-alkyl, lower-alkoxy or halogen; R^o is hydrogen, lower-alkyl or hydroxy-lower-alkyl; R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl; and An is halide.

3,996,283

PROCESS FOR THE PRODUCTION OF POLYAMINES

Hartmut Knofel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1973, Ser. No. 383,921

Claims priority, application Germany, Aug. 4, 1972, 2238379; Mar. 29, 1973, 2238920

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570 D **13 Claims**

1. A process for the preparation of a multinuclear aromatic polyamine which comprises the steps of

a. condensing an aromaic amine with formaldehyde in the presence of an aqueous acid catalyst to obtain the condensation mixture as an aqueous phase,

b. extracting the aqueous condensation mixture with a hydrophobic solvent to provide a solvent phase and a separate aqueous phase containing the acid catalyst as ammonium salts of said aromaic amine,

c. recovering polyamine from the solvent phase and

d. returning said aqueous phase containing the acid ammonium salt catalyst to step a.

10. A process for the preparation of separate polyamines which have a high and a low 2,4′-diamino-diarylmethane content which comprises the steps of

a. condensing an aromatic amine with formaldehyde in the presence of an aqueous acid catalyst to obtain the condensation mixture as an aqueous phase,

b. extracting the aqueous condensation phase with a hydrophobic solvent to provide a solvent phase and a separate aqueous phase and

c. separately recovering

i. polyamines having a high 2,4′-isomer content from said solvent phase and

ii. polyamines having a low 2,4′-isomer content from said aqueous phase.

3,996,284

NAPHTHYL AND TETRAHYDRONAPHTHYL DI-ETHERS

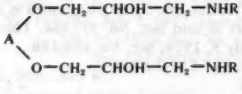
Wijbe Thomas Nauta, Rembrandtlaan 17, Nieuw Loosdrecht, Netherlands

Continuation-in-part of Ser No. 127,381, abandoned. This application Apr. 10, 1974, Ser. No. 459,721

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **11 Claims**

1. Naphthyl and tetrahydronaphthyl diethers of the formula



wherein A represents a naphthylene group or a 5,6,7,8-tetrahydronaphthylene group having their ether chains attached to the 1 and 2 or 2 and 3 positions or, when A represents a naphthylene group, to the 1 and 8 positions, which aromatic groups may also have substituted therein one to three substituents selected from halogen atoms, lower alkyl, lower alkenyl, benzyl, nitro and lower acyl groups, said substituents being present in the aromatic part in case A represents a 5,6,7,8-tetrahydronaphthylene group and R represents an isopropyl or tertiary butyl group, and acid addition salts thereof.

3,996,285

1-(N-DIHYDROXYALKYL) AMINOALKYLENE-2-PROPENYL SUBSTITUTED HYDROCARBONS

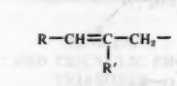
George S. Culbertson, Downers Grove, Ill.

Division of Ser. No. 391,590, is a continuation-in-part of Ser. No. 116,722, Feb. 11, 1971, abandoned. This application Apr. 17, 1975, Ser. No. 568,849

Int. Cl.² C07C *83/00* , *87/02*, *87/24*

U.S. Cl. 260—584 R **1 Claim**

1. An N-hydrocarbyl-substituted hydroxyalkyl alkylene polyamine product of the formula $Z—(NH—A—)_mN(X—OH)_2$ wherein m is an integer from 1 to 10, —A—, is a divalent alkylene hydrocarbon radical consisting of 1 to 10 methylene radicals, X is $—C_2H_4—$ or $—C_3H_6—$, and Z is



wherein R′ is hydrogen and R consists of propyl units and the total carbon content of Z is in the range of from 25 to 180.

3,996,286

α-BROMO-PIVALOYL TOLUENES

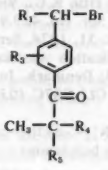
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 342,463, March 19, 1973, Pat. No. 3,919,309, which is a continuation-in-part of Ser. No. 281,916, Aug. 18, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,536

Int. Cl.² C07C *49/80*

U.S. Cl. 260—592 **1 Claim**

1. A compound of the formula



where

R_1 represents hydrogen, or alkyl of 1 to 2 carbon atoms, and

R_3 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy, and

R_4 and R_5 each independently, represent alkyl having 1 or 2 carbon atoms.

3,996,287

PROCESS FOR PRODUCING 2-MERCAPTO-1,4-DIONES

William J. Evers, Middletown (Red Bank Post Office); Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 478,354, June 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,452, Aug. 7, 1973, abandoned. This application July 8, 1975, Ser. No. 594,127

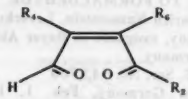
The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R **7 Claims**

1. A process for producing a 3-mercapto-alkane-4-one-1-al comprising the steps of:

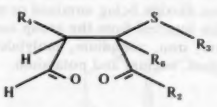
i. Admixing an alk-2-ene-4-one-1-al having the structure:



with a sulfur compound having the formula:

R_3SH

in the presence of an organic base selected from the group consisting of secondary amines and tertiary amines thereby providing a substituted or unsubstituted 3-thia alkane-4-one-1-al having the structure:



wherein R_3 is selected from the group consisting of acetyl and benzoyl; wherein R_2 is lower alkyl; and wherein R_4 and R_6 are the same or different and are each selected from the group consisting of hydrogen and lower alkyl; and

ii. Hydrolyzing the resulting 3-thia alkane 4-one-1-al by:

a. First admixing 2–5% aqueous alkali metal hydroxide with said 3-thia alkane-4-one-1-al at a temperature in the range off 20°–50° C at atmospheric pressure; and then

b. Admixing the resulting composition at a temperature in the range of 20°–50° C at atmospheric pressure with dilute acid, whereby the pH of the composition is adjusted to a pH in the range of from about 5 up to 6.

3,996,288

METHOD OF PRODUCING ALDEHYDES BY HYDROFORMYLATION

Toshihide Yukata; Nobuyuki Yamakami; Masao Honma, all of Kawasaki; Yoshioki Komachiya, Yokohama, and Hachiro Wakamatsu, Musashino; all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 426,192, Dec. 19, 1973, abandoned. This application May 22, 1974, Ser. No. 472,150

Claims priority, application Japan, Dec. 23, 1972, 48-1254

Int. Cl.² C07C *45/00*

U.S. Cl. 260—599 **4 Claims**

1. A method of preparing phenylacetaldehyde which comprises holding a reaction mixture including hydrogen, carbon monoxide, an amide of a carboxylic acid and benzyl chloride at 50° C to 200° C and at a pressure between 10 and 500 atmospheres in the presence of a carbonylation catalyst until said aldehyde is formed,

the concentration of said amide in said mixture being at least 0.01 mole per liter, and

said carbonylation catalyst containing as the principal active agent, a transition element of Group VIII of the Periodic Table.

3,996,289

PROCESS FOR THE PREPARATION OF 2-NITROBENZALDEHYDE

Horst Meyer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Mar. 11, 1975, Ser. No. 557,297

Claims priority, application Germany, Mar. 28, 1974, 2415061

Int. Cl.² C07C *51/16*

U.S. Cl. 260—599 **6 Claims**

1. The process for the preparation of 2-nitrobenzaldehyde wherein 2-nitrotoluene is treated with a diester of oxalic acid in the presence of an alkali metal alcoholate to yield the alkali metal salt of 2-nitrophenylpyruvic acid, said salt is treated with solid potassium permanganate at a temperature of from about −10° to about 50° C in a binary solvent system comprising water and a water immiscible organic solvent for 2-nitrobenzaldehyde, and said 2-nitrobenzaldehyde is separated from said reaction mixture in said water immiscible solvent.

3,996,290

2,4-DIMETHYL-2-PHENYL-4-PENTENAL

Robert F. Tavares, Cedar Grove, and Jack Agran, Wallington, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed June 11, 1975, Ser. No. 585,935

Int. Cl.² C07C *47/52*

U.S. Cl. 260—599 **1 Claim**

1. 2,4-Dimethyl-2-phenyl-4-pentenal.

3,996,291

PROCESS FOR THE PRODUCTION OF 4-HYDROXY-3,5-DIBROMOBENZALDEHYDE

Henri Dietrich, Arlesheim; Jörg Kallen, Allschwil, and Gottfried Seifert, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,831

Claims priority, application Switzerland, Mar. 25, 1974, 4105/74

Int. Cl.² C07C *45/00*

U.S. Cl. 260—600 R **7 Claims**

1. A process for the production of 4-hydroxy-3,5-dibromobenzaldehyde which comprises the steps of reacting p-cresol with bromine at a temperature of from about 0° to 50° C in a molar ratio of about 1:2 to form 2,6-dibromo-p-cresol; reacting said 2,6-dibromo-p-cresol with about 2.0 moles of bromine at a temperature of from about 120° to 180 ° C. by means of side-chain bromination to form 4-hydroxy-3,5-dibromobenzal bromide; and hydrolyzing said bromide with water to yield said 4-hydroxy-3,5-dibromobenzaldehyde.

3,996,292

PROCESS FOR THE PREPARATION OF ALIPHATIC DIALDEHYDES

Jean-Pierre Decor, Villeurbanne, France, assignor to Rhone-Poulenc S.A., Paris, France

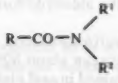
Filed Oct. 7, 1974, Ser. No. 512,983

Claims priority, application France, Oct. 10, 1973, 73.36158

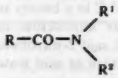
Int. Cl.² C07O *47/12*

U.S. Cl. 260—601 R **7 Claims**

1. Process for the preparation of an aliphatic dialdehyde which comprises reducing with hydrogen at a temperature of 20° –150° C. a dicarboxylic acid chloride wherein the two chloroformyl groups of the dicarboxylic acid chloride are separated by at least 6 carbon atoms and having 6–18 carbon atoms in the alkylene group joining the two chloroformyl groups, in the presence of a catalyst consisting essentially of palladium, optionally deposited on a support, and in the presence of 10^{-5} to 10^{-1} mols, per chloroformyl group, of a tertiary amide having the formula



in which:



R^1 and R^2 independently represent a straight or branched aliphatic group having at most 6 carbon atoms, a cycloaliphatic group having 5 or 6 ring carbon atoms, or a phenyl, phenylalkyl or alkylphenyl group, the alkyl substituent of which phenyl group contains at most 4 carbon atoms, or R^1 and R^2 together form a saturated or unsaturated divalent radical having 4 or 5 carbon atoms, and R is as defined for R^1 and R^2 or represents hydrogen or forms together with one of the radicals R^1 and R^2, a divalent radical having from 3 to 5 carbon atoms.

3,996,293

SELECTIVE HYDROFORMYLATION PROCESS

John F. Knifton, Poughquag, N.Y., and Irving Schwager, Lompoc, Calif., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 251,639, May 8, 1972. This application Oct. 3, 1973, Ser. No. 402,935

The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.

Int. Cl.² C07C *45/08*

U.S. Cl. 260—604 HF 5 Claims

1. A process for preparing primarily linear aldehyde products by the selective and catalytic hydroformylation of alpha-olefins contained in a mixture of alpha-olefins and internal olefins, wherein said alpha-olefins in the mixture constitute from 10 to 90 mole % of the olefin mixture, said alpha and internal olefins containing from 2 to 30 carbon atoms, by:

A. contacting each mole of said alpha-olefins and internal olefins in said mixture to be hydroformylated in a deoxygenated environment, with from about 0.001 to 0.1 moles of a three component, ligand stabilized, homogeneous platinum(II) catalyst complex selected from the group consisting of:

$PtCl_2[P(C_6H_5)_3]_2$-$SnCl_2$,
$PtCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$-$SnCl_2$,
$PtCl_2[P(n\text{-}C_4H_9)_3]_2$-$SnCl_2$,
$PtCl_2[As(C_6H_5)_3]_2$-$SnCl_4$
$PtCl_2[P(C_6H_5)_3]_2$-$GeCl_2$,
$PtCl_2[P(CH_3)_2C_6H_5]_2$-$SnCl_2$,
$PtCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2$-$SnCl_2$,
$PtCl_2[P(OC_6H_5)_3]_2$-$SnCl_2$ and
$PtCl_2[As(C_6H_5)_3]_2$-$SnCl_2$,

said tin(II) or germanium(II) chlorides mole ratio to said ligand stabilized platinum(II) catalyst complex ranging from about 2:1 to 8:1, in the presence of sufficient inert solvent to disperse the components of the admixture, to form a deoxygenated reaction mixture,

B. pressurizing said reaction mixture to between about 100 psig to 3,000 psig with a sufficient equi-volume admixture of a gaseous hydrogen to carbon monoxide, to satisfy the stoichiometry of the aldehyde-forming hydroformylation reaction,

C. heating said pressurized reaction admixture between 25° to 125° C until between about 80% to about 95% of said alpha-olefins contained in said olefin mixture is converted to linear aldehyde, and then

D. isolating said linear aldehyde products contained therein.

3,996,294

OXIDIZING METHANE TO FORMALDEHYDE

Laszlo Imre, Cologne, and Heinrich Nassenstein, Leverkusen-Steinbuechel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 23, 1975, Ser. No. 543,700

Claims priority, application Germany, Feb. 1, 1974, 2404737

Int. Cl.² C07C *45/02*

U.S. Cl. 260—604 R 4 Claims

1. In the gas phase reaction of methane and oxygen at elevated temperature to form formaldehyde, the improvement which comprises effecting the reaction at a temperature of about 450° to 750° C and a pressure of about 1 to 100 atmospheres in the presence of silicon dioxide as catalyst, the silicon dioxide having an internal surface area of about 30 m^2/g to 500 m^2/g, the silicon dioxide being unmixed or mixed with at least one other oxide selected from the group consisting of oxides of aluminum, iron, vanadium, molybdenum, tungsten, calcium, magnesium, sodium and potassium.

3,996,295

PREPARATION OF DIMETHYLSULFOXIDE BY LIQUID PHASE REACTION OF DIMETHYSULFIDE AND HYDROGEN PEROXIDE

André Goeb, Capvern les Bains, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 7, 1975, Ser. No. 593,370

Claims priority, application France, July 4, 1974, 74.23264

Int. Cl.² C07C *147/14*

U.S. Cl. 260—607 D 11 Claims

1. A method of forming dimethylsulfoxide which comprises:

introducing dimethylsulfide and hydrogen peroxide into a substantially homogeneous aqueous-dimethylsulfoxide liquid reaction medium wherein the dimethylsulfide is introduced in amounts soluble in the reaction medium and the dimethylsulfoxide is present in the reaction medium in amounts of from about 44 percent to 66 percent by weight;

mixing the dimethylsulfide and the hydrogen peroxide in the liquid medium for a time sufficient to cause oxidation of the dimethylsulfide and substantially complete conversion of the hydrogen peroxide; and

recovering the dimethylsulfoxide formed.

3,996,296

NOVEL COMPOUNDS, 4-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-2-BUTANOL AND 4-(6,6-DIMETHYL-2-METHYLENE-3-CYCLOHEXEN-1-YL)-2-BUTANOL

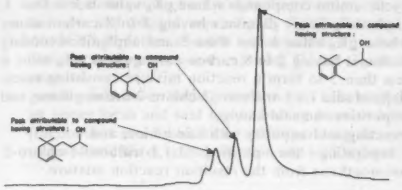
Braja Dulal Mookherjee, Matawan; Manfred Hugo Vock, Locust, both of N.J.; Carlos Benaim, Hartsdale, and Edward J. Shuster, Brooklyn, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

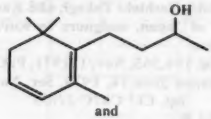
Continuation-in-part of Ser. No. 461,704, April 17, 1974, Pat. No. 3,899,597. This application Mar. 24, 1975, Ser. No. 561,187

Int. Cl.² C07C *31/13*

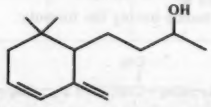
U.S. Cl. 260—617 R 1 Claim

1. A mixture of compounds having the structures:

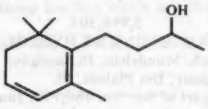

Peak attributable to compound having structure :
OH
Peak attributable to compound having structure :
Peak attributable to compound having structure : OH



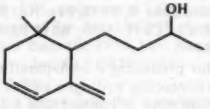
and



wherein the ratio of the compound having the structure:



:the compound having the structure:



is 65:18.

3,996,297

PROCESS FOR PURIFICATION OF 2,6-XYLENOL

Bruce E. Leach, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 25, 1975, Ser. No. 607,734
Int. Cl.² C07C *39/06*, *37/38*
U.S. Cl. 260—621 B **4 Claims**

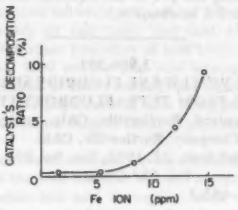
1. A method for separating 2,6-xylenol from admixture with meta,para-cresols comprising methylating the meta,para-cresols with methanol over alumina catalysts to form 2,4/2,5-xylenol and 2,3/3,5-xylenol, and separating the 2,6-xylenol from the resulting mixture by distillation, wherein the methylation is carried out at a mole ratio of methanol to starting mixture of from about 0.2 to 1.0, a temperature of from about 320° C to 390° C, and a pressure of from about 300 to about 600 pounds per square inch gauge.

3,996,298

PROCESS FOR THE HYDRATION OF OLEFINS

Yusuke Izumi, Shinnanyo; Sumio Akiyama, Tokuyama; Kinya Yamazaki, Yono; Masato Todo, and Takao Tomita, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Continuation of Ser. No. 238,129, March 27, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 520,094
Claims priority, application Japan, May 31, 1971, 46-18720
Int. Cl.² C07C *29/04*
U.S. Cl. 260—641 **4 Claims**



1. In a process for the preparation of monohydric alcohols by contacting a mono-olefin of 2-4 carbon atoms with an aqueous solution containing heteropoly-acid ions selected from the group consisting of borotungstic acid ions, phosphotungstic acid ions, silicotungstic acid ions, silicomolybdic acid ions and phosphomolybdic acid ions in a concentration of 1/40,000 to 1/300 mol per liter and at a pH ranging from 2.0 to 4.5 in the liquid phase at a pressure within the range of 100–500 Kg/cm²G and at a temperature within the range of 150–370° C, thereby to subject the olefin to hydration reaction, the improvement comprising maintaining the free iron ion concentration of said aqueous solution at not higher than 10 ppm substantially throughout the whole hydration reaction period by performing said hydration reaction in a reaction vessel of which at least the internal surface is constructed of a metal selected from the group consisting of nickel, chromium, titanium, zirconium, tantalum, silver, gold and platinum.

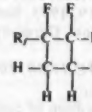
3,996,299

FLUORO COMPOUND PREPARATION

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 8, 1973, Ser. No. 330,736
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² C07C *23/06*
U.S. Cl. 260—648 F **3 Claims**

1. As a new composition of matter a compound of the formula



and mixtures thereof wherein R_f is a perfluoroalkyl radical having 1–10 carbon atoms per molecule and wherein skeletal branching, if present, is no closer than the 2-position with respect to the carbon atom to which it is attached.

3,996,300

REMOVAL OF CHLORAL FROM EFFLUENT GAS OF 1,2-DICHLOROETHANE SYNTHESIS

Ross C. Ahlstrom, Jr., Bay City, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1976, Ser. No. 668,009
Int. Cl.² C07C 17/38
U.S. Cl. 260—652 P 3 Claims

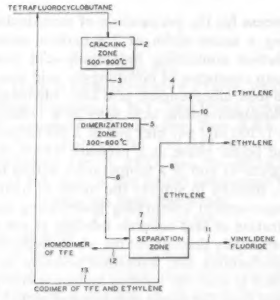
1. In a process wherein the effluent from an oxychlorination reactor employed in the manufacture of 1,2-dichloroethane is quenched to remove chloral therefrom by employing an aqueous alkaline quench solution, the improvement which comprises controlling the pH of the aqueous solution within the range of about 7.8 to about 9.3.

3,996,301

PRODUCING VINYLIDENE FLUORIDE SUBSTANTIALLY FREE FROM TETRAFLUOROETHYLENE

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 22, 1972, Ser. No. 291,353
Int. Cl.² C07C 21/02
U.S. Cl. 260—653.3 8 Claims



VINYLIDENE FLUORIDE PROCESS

1. A process for producing vinylidene fluoride substantially freed from tetrafluoroethylene which comprises subjecting tetrafluorocyclobutane as can be obtained by the codimerization of tetrafluoroethylene and ethylene to cracking to produce a cracking effluent containing vinylidene fluoride and concomitantly to produce tetrafluoroethylene and ethylene, passing the cracking zone effluent thus obtained into a dimerization zone, therein causing dimerization of the tetrafluoroethylene under codimerization conditions to form at least one of OFCB and TFCB, passing the dimerized effluent to a separation zone, therein separating vinylidene fluoride substantially freed from tetrafluoroethylene.

3,996,302

PROCESS FOR PURIFYING 1,1,1-TRIFLUORO-2-CHLORO-2-BROMOETHANE

Neithart Schultz, Eichsel, and Hans-Joachim Vahlensieck, Wehr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 224,628, Feb. 8, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,991
Claims priority, application Germany, Apr. 28, 1971, 2120756
Int. Cl.² C07C 17/38, 19/08
U.S. Cl. 260—653 10 Claims

1. A process for the purification of contaminated 1,1,1-trifluoro-2-chloro-2-bromoethane comprising:

a. mixing 1,1,1-trifluoro-2-chloro-2-bromoethane containing impurities of compounds consisting essentially of the formula $CF_3—CX=CY—CF_3$ where X is hydrogen, chlorine or bromine and Y is chlorine or bromine, with at least one organic amine selected from the group consisting of acyclic amino compounds whose pK_b is less than 3, cyclic amino compounds whose pK_b value is less than 3, aliphatic primary diamines having 2 to 8 carbon atoms whose pK_b value is less than 3 and aliphatic secondary diamines having 2 to 8 carbon atoms whose pK_b value is less than 3 to form a reaction mixture consisting essentially of said 1,1,1-trifluoro-2-chloro-2-bromoethane, said impurities and said amine;

b. reacting said impurity with said amine; and

c. separating the purified 1,1,1-trifluoro-2-chloro-2-bromoethane from the resultant reaction mixture.

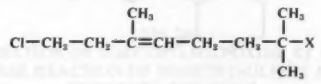
3,996,303

ORGANIC HALIDE

Hiroyuki Nomori; Takuo Kawaguchi, both of Kurashiki; Kozo Nakao, Okayama; Masahisa Tanomura; Takashi Nishida, both of Kurashiki; Toshiaki Takagi, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 194,565, Nov. 1, 1971, Pat. No. 3,862,212. This application June 14, 1974, Ser. No. 479,413
Int. Cl.² C07C 21/00
U.S. Cl. 260—654 R 1 Claim

1. An organic halide having the formula:



wherein X is a halogen atom.

3,996,304

HYDROPROCESSING OF HYDROCARBONS

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application June 9, 1975, Ser. No. 585,265
Int. Cl.² C07C 5/10; B01J 23/62
U.S. Cl. 260—667 3 Claims

1. A process for producing a cycloparaffinic hydrocarbon which comprises contacting hydrogen and an aromatic hydrocarbon in a reaction zone, in contact with a catalytic composite containing 0.01% to about 2% by weight of a platinum or palladium component, from about 0.01% to about 2% by weight of a rhodium component, from about 0.01% to about 5% by weight of a tin component and from about 0.01% to about 1.5% by weight of an alkalinous metal component, calculated as elements, separating the resulting reaction zone effluent to recover said cycloparaffinic hydrocarbon.

3,996,305

FRACTIONATION OF AROMATIC STREAMS

Charles V. Berger, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

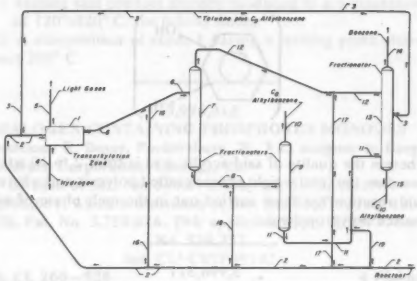
Filed Mar. 27, 1975, Ser. No. 562,511
Int. Cl.² C07C 3/62
U.S. Cl. 260—672 T 2 Claims

1. A transalkylation process for producing principally benzene and C_8 alkylbenzene products comprising the steps of:

a. transalkylating an admixture of toluene and C_9 alkylbenzenes in a transalkylation zone at transalkylation conditions to result in transalkylation zone effluent including benzene, toluene, C_8 alkylbenzene, C_9 alkylbenzene, and C_{10} alkylbenzene;

b. separating said transalkylation zone effluent in a fractionation zone to produce a lower boiling fraction comprising benzene and toluene, a principally C_8 alkylbenzene central boiling fraction which is withdrawn as a product, and a higher boiling fraction comprising C_9 and C_{10} alkylbenzene;

c. passing said lower boiling fraction into a fractionator at an upper locus and said higher boiling fraction into said fractionator at a lower locus and separating the components of said lower boiling fraction and said higher boiling



fraction to produce a principally benzene overhead fraction which is withdrawn as a product, at least one side-cut fraction which contains toluene and C_9 alkylbenzene and which is withdrawn from said fractionator intermediate the loci of introduction of said lower boiling fraction and said higher boiling fraction, and a principally C_{10} alkylbenzene bottoms fraction which is withdrawn as a product; and,

d. recycling said side-cut fraction to said transalkylation zone.

3,996,306

AROMATIC HYDROCARBON ISOMER SEPARATION PROCESS

Donald J. Korous, Bensenville, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 136,199, April 21, 1971. This application Dec. 18, 1975, Ser. No. 641,805

Int. Cl.² C07C 7/13

U.S. Cl. 260—674 SA **18 Claims**

1. A process for separating the para-isomer from a feed mixture comprising at least two bi-alkyl substituted monocylic aromatic isomers, including the para-isomer, said isomers having more than eight and less than about eighteen carbon atoms per molecule, which process comprises contacting at adsorption conditions said feed with an adsorbent comprising type Y zeolite essentially completely exchanged with a single cation selected from the group consisting of potassium, rubidium and cesium to effect the adsorption of the para-isomer and thereafter recovering the para-isomer.

11. A process for separating the para-isomer from a feed stream comprising at least two bi-alkyl monosubstituted aromatic isomers, including the para-isomer, said isomers having more than eight and less than about eighteen carbon atoms per molecule which process employes an adsorbent comprising type Y zeolite essentially completely exchanged with a single cation selected from the group consisting of potassium, rubidium and cesium and which process comprises the steps of:

a. maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

b. maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

c. maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

d. maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

e. passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of said para-isomer by said adsorbent in said adsorption zone and withdrawing a raffinate output stream from said adsorption zone;

f. passing a desorbent material having a boiling point different than that of the feed mixture to permit separation therefrom by distillation into said desorption zone at desorption conditions to effect the displacement of said para-isomer from the adsorbent in said desorption zone;

g. withdrawing an extract stream comprising said para-isomer and desorbent material from said desorption zone;

h. passing at least a portion of said extract output stream to a fractionation means and therein fractionating at fractionation conditions said para-isomer from said desorbent material to produce a para-isomer product substantially free of desorbent material; and

i. periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams.

3,996,307

VINYL ESTER RESINS WITH IMPROVED SOLUBILITY IN STYRENE

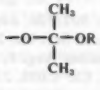
Daniel J. Najvar, and Jerry M. Hawkins, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1975, Ser. No. 576,072

Int. Cl.² C08L 63/02

U.S. Cl. 260—837 R **7 Claims**

1. A vinyl ester resin having improved solubility in styrene comprising the reaction product of about equivalent amounts of an unsaturated monocarboxylic acid and a polyepoxide having more than one 1,2-epoxide group per molecule wherein said resin is further reacted with an isopropenyl alkyl ether to convert at least about 10 percent of the aliphatic hydroxyl groups to pendant ketal groups of the formula



where R is an alkyl or cycloalkyl group of 1 to about 6 carbon atoms.

3,996,308

ANAEROBIC PRESSURE SENSITIVE ADHESIVE COMPOSITION

Maurice Douek, Los Angeles; Gustav A. Schmidt, South Pasadena, both of Calif.; Bernard M. Malofsky, Bloomfield, and Martin Hauser, West Hartford, both of Conn., assignors to Avery Products Corporation, San Marino, Calif. and Loctite Corporation, Newington, Conn., part interest to each

Filed Feb. 19, 1974, Ser. No. 443,223
Int. Cl.² C08L 75/04
U.S. Cl. 260—859 R 12 Claims

1. A curable, essentially solvent free anaerobic pressure sensitive adhesive composition comprising a mixture of:

a. about 35 to about 99 percent by weight of an anaerobic resin system which is stable in the presence of oxygen and which contains at least one anaerobically curable resin having at least one polymerizable acrylate ester moiety;

b. about one to about 65 percent by weight of a thermoplastic polymer system containing at least one high molecular weight urethane polymer capable of combining a substantial quantity of said anaerobic resin system;

c. about 0.5 to about 20 percent, based on the total weight of (a) and (b), of a catalyst system for said anaerobic resin system, said catalyst system comprising a peroxy compound, an organic compound for accelerating cure of said anaerobic resin system and a stabilizer for said anaerobic resin system,

said anaerobic pressure sensitive adhesive, when in an essentially solvent-free state, being permanently tacky at room temperature and having a static shear strength of at least about two minutes at a 250 gram load per 0.25 square inch and a 180° peel value of at least about 0.5 lb. per inch, and curable upon substantial exclusion of oxygen.

3,996,309

STABILIZERS FOR POLYMERIC DISPERSIONS CONTAINING MASKED HYDROXYL GROUPS

Rostyslaw Dowbenko, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 807,419, March 14, 1969, abandoned. This application Nov. 7, 1972, Ser. No. 304,579
Int. Cl.² C08L 31/00
U.S. Cl. 260—874 10 Claims

1. A dispersion stabilizer comprising a copolymer having a polymeric backbone and at least one polymeric side chain, the average copolymer molecule having a polymeric backbone which has attached thereto at least five polymeric side chains, said polymeric side chains

a. being of a polarity different than that of said polymeric backbone;

b. having attached thereto hydroxyl groups masked so that the resultant copolymer has essentially no hydroxyl functionality; and

c. being derived from a macromonomer having a molecular weight of at least 500

the weight ratio of said macromonomer to said backbone being in the range of from 0.5:1 to 5:1.

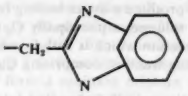
3,996,310

POLYMERS CONTAINING NON-EXTRACTABLE/NON-VOLATILE ADDITIVES AND PROCESSES FOR THEIR PREPARATION

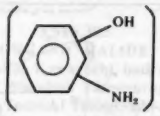
Joseph C. Floyd, and Don A. Plank, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 501,723, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 240,463, April 3, 1972, abandoned. This application Aug. 1, 1975, Ser. No. 600,994
Int. Cl.² C08L 23/00
U.S. Cl. 260—878 R 1 Claim

1. A polymeric composition of matter comprising polypropylene having pendant



groups, which has been obtained by extruder reaction of acrylic acid grafted propylene with O-aminophenol



wherein the quality of said acrylic acid is from 2 to 10 wt. % based on the total weight of said grafted polymer and wherein said reaction has been carried out in the melt phase of said grafted polypropylene.

3,996,311

GRAFT POLYBUTADIENE-STYRENE INTERPOLYMERS AND PROCESS FOR MAKING SAME

Richard C. Westphal, Leominster, and Paul Heinig, Bolton, both of Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

Continuation-in-part of Ser. No. 194,021, Oct. 29, 1971, abandoned, and a continuation-in-part of Ser. No. 640,478, May 23, 1967, Pat. No. 3,868,434, which is a continuation-in-part of Ser. No. 457,794, May 21, 1965, abandoned, which is a continuation-in-part of Ser. No. 155,200, Nov. 27, 1961, abandoned, which is a continuation-in-part of Ser. No. 759,145, Sept. 5, 1958, abandoned. This application Feb. 24, 1975, Ser. No. 552,385
The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.
Int. Cl.² C08L 9/06
U.S. Cl. 260—880 R 27 Claims

1. A moldable composition, having improved impact value, comprising a graft interpolymer of styrene and from about 1 to 20 percent of a rubbery, 1,4-polybutadiene, based on the total composition weight, said amount of polybutadiene being effective in substantially improving the impact value in said composition, said 1,4-polybutadiene characterized by having a cis butadiene content of at least 25 percent and a 1,2-addition content of not more than about 10 percent based on the weight of said 1,4-polybutadiene, said composition prepared by polymerizing under free radical polymerization conditions, with agitation, a homogeneous mixture comprising said styrene and said polybutadiene to provide a dispersed and substantially uniform composition, said composition containing a continuous phase which is polymerized styrene and a discontinuous phase which is a graft copolymer of 1,4-polybutadiene and styrene, said discontinuous phase being substantially insoluble in toluene at room temperature.

3,996,312

HALOPHENOXYPHOSPHAZENE FIRE RETARDANTS

Charles H. Kolich, Northville; Henry G. Braxton, Jr., Franklin, and Urho A. Lehikoinen, Detroit, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 21, 1974, Ser. No. 525,932
Int. Cl.² C07C 9/06; C08K 5/53
U.S. Cl. 260—927 N 3 Claims

1. As a composition of matter, a halogenated monohydroxy aromatic phosphazene crosslinked by a P—O—P bond, said phosphazene being prepared by a process comprising:

a. reacting a phosphonitrilic chloride with a sodium salt of a

monohydroxy halogenated phenol, the amount of said salt being less than that required to react with all the chlorine atoms in said phosphonitrilic chloride, said amount of said salt being from about 1 to about 0.5 theory,

b. reacting the product thereby produced with a lower sodium alkoxide such that residual chlorine remains in the intermediate thereby produced, the amount of said lower alkoxide being enough to theoretically react with all of the remaining chlorine atoms in said phosphonitrilic chloride, and

c. heating said product thereby produced to a temperature of 120°–220° C. for 0.5–48 hours.

2. A composition of claim 1 having a melting point above about 200° C.

3,996,313
HALOGEN CONTAINING PHOSPHORUS MONOOLS

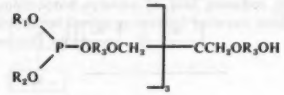
Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 360,474, May 15, 1973, Pat. No. 3,906,061, which is a division of Ser. No. 55,575, July 16, 1970, Pat. No. 3,758,646. This application Jan. 3, 1975, Ser. No. 538,337

Int. Cl.² C07F 9/142

U.S. Cl. 260—928 **4 Claims**

1. A compound having the formula



wherein each of R_1 and R_2 is haloalkyl of 2 to 3 carbon atoms and R_3 is lower alkylene of at least 2 carbon atoms, the halogen atoms having an atomic weight up to 80.

3,996,314
COOLING APPARATUS

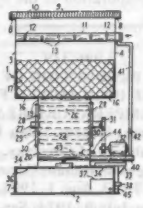
Gerard Lakmaker, Northwood, England, assignor to I.C.M.S. Ltd., London, England

Filed May 12, 1975, Ser. No. 576,855

Claims priority, application United Kingdom, May 30, 1974, 24024/74; Nov. 11, 1974, 48748/74

Int. Cl.² F28C 1/00

U.S. Cl. 261—30 **25 Claims**



1. In an evaporative liquid cooling apparatus having a housing, means in said housing, for delivering a liquid downwardly through said housing, heat exchange means disposed in said housing, beneath said liquid delivery means, collecting means in said housing, for said liquid, said collecting means being located beneath said heat exchange means, a chamber in said housing, beneath said heat exchange means and defined by said collecting means and wall portions of said housing, and fan means for delivering a flow of air to said heat exchange means, the improvement comprising

a. fan means located inside said chamber, above said collection means, said fan means comprising,

i. casing means extending between oppositely facing ones of said housing wall portions, said oppositely facing housing wall portions defining air inlet apertures, and side casing means defining air inlet openings, at its opposite sides, which align with said air inlet apertures, and an air outlet opening, and

ii. at least one fan in said casing means, and

b. means securing said opposite sides of said casing means directly to said oppositely facing housing wall portions.

3,996,315
VAPORIZATION APPARATUS FOR INTERNAL COMBUSTION ENGINES

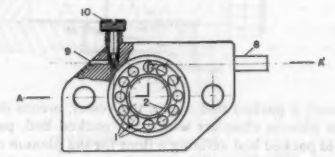
René Laurent Hérail, 138 Bd Berthier, 75017 Paris, France

Filed Nov. 5, 1974, Ser. No. 521,194

Claims priority, application France, Nov. 9, 1973, 73.39940; Dec. 19, 1973, 73.45408

Int. Cl.² F02M 23/12

U.S. Cl. 261—63 **1 Claim**



1. Apparatus for the vaporization of a fuel mixture for internal combustion engines, said apparatus being placed below the throttle valve of a conventional carburetor and which comprises a body member provided with a central bore having a frusto-conical outlet section, a cylindrical array of circumferentially spaced bores having frusto-conical outlet sections, and which surround and are of the same length as and are co-axial with said central bore but have a smaller diameter thereby to provide different flow-through speeds, the outlet edges of said smaller diameter bores being tangent to the outlet edge of said central bore, a first supplementary air intake port positioned adjacent the inlet end of one of said smaller diameter bores and tangent to the edge thereof, means controlled automatically in accordance with the amount of depression generated by operation of the throttle valve from one position to another for varying the amount of air passed through said first supplementary air intake port, a second supplementary air intake port positioned adjacent the inlet end of another one of said smaller diameter bores tangent thereto and directly beneath the idling orifice of the carburetor, and means for manually controlling the amount of air passed through said second supplementary air intake port comprising a micrometric prick punch screw for variably closing off the air passage through the port.

3,996,316
FEED SYSTEM FOR PACKED BED

George Friedman, Clark, and Harold B. Kohn, Cedar Grove, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 417,813, Nov. 21, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 606,126

Int. Cl.² B01D 47/14

U.S. Cl. 261—96 **10 Claims**

1. A contacting apparatus, comprising:

a vessel;

a packed bed within the vessel;

an inlet pipe connected to the vessel wall for introducing liquid into the packed bed;

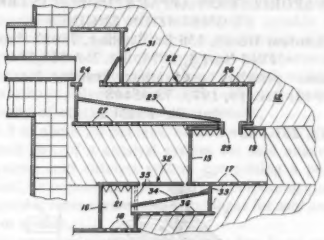
a main liquid distributor positioned entirely within and supported solely by the packed bed;

a main liquid conduit positioned entirely within and supported solely by the packed bed for passing liquid from the inlet pipe to the main liquid distributor;

a plurality of auxilliary liquid distributors for distributing liquid into the packed bed positioned entirely within and supported solely by the packed bed; and

a plurality of auxilliary liquid conduits positioned entirely within and supported solely by the packed bed for passing liquid from the main liquid distributor to the auxilliary liquid distributors.

7. A contacting apparatus, comprising:



a vessel; a packed bed within the vessel; means defining a gas plenum chamber within the packed bed, packing of said packed bed defining a floor for the plenum chamber; gas feed inlet means for introducing gas into the plenum chamber; a plurality of gas distributing means supported solely by and within the packed bed, in fluid communication with packing above and below said plenum chamber; and roof means for preventing vapor from flowing from said plenum chamber directly to packing above the plenum chamber whereby gas flows from the plenum chamber through the packing floor thereof and through the gas distributing means into packing above said plenum chamber.

3,996,317

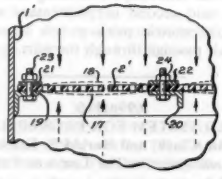
GAS-LIQUID SCRUBBER WITH RESILIENT FLEXIBLE GRIDS

Otto M. Sarmiento, Darien, Conn., and Peter Ekholm, Mahwah, N.J., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 4, 1974, Ser. No. 520,819

Int. Cl.² B01F *3/04*

U.S. Cl. 261—97 **7 Claims**



1. In a gas-liquid scrubber chamber having a plurality of transverse flow distributing grid means therein which contain perforations which limit the flow rate of a descending liquid stream and distribute said stream so as to contact a rising gas stream laden with solids which can deposit on the transverse perforated grids in the chamber, the improvement which comprises, providing that each transverse flow distributing grid means is perforated to have a majority of its transverse area be open area and have a majority of the remaining non-open transverse area comprise flexible, resilient deformable elastomeric material that flexes during operation to fracture or break off particles of solids buildup on said material.

3,996,318

DYNAMIC MEMBRANE

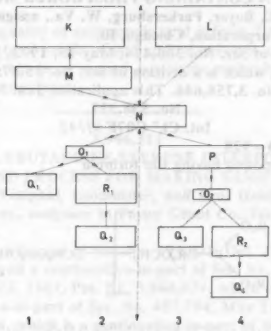
Jan Willem van Heuven, Apeldoorn, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Dec. 17, 1973, Ser. No. 425,185

Claims priority, application United Kingdom, Dec. 21, 1972, 59086/72

Int. Cl.² B01D *13/04*

U.S. Cl. 264—5 **26 Claims**



1. A process for making thin polymer foils for use in a dynamic membrane which comprises the steps of

dispersing in water a non-aqueous liquid phase, which phase contains a polymerization reactant B and which phase is substantially immiscible with water and has a boiling point below that of water;

adding an aqueous solution of a polymerization reactant A, which results in a polymer forming at the interface of the non-aqueous phase and the water, said polymer encapsulating the non-aqueous phase; and

heating the dispersion to a temperature above the boiling point of the non-aqueous phase but below the boiling point of water, which heating results in rupture of the encapsulating polymer to form a dispersion of thin polymer foils and in evaporation of the non-aqueous phase.

3,996,319

PROCESS FOR THE PRODUCTION OF PRESSED BLOCK FUEL ELEMENTS OF HIGH POWER FOR GAS COOLED HIGH TEMPERATURE REACTOR

Karl-Gerhard Hackstein, Hanau; Milan Hrovat, Rodenbach, and Willi Wolff, Kahl, all of Germany, assignors to Nukem G.m.b.H., Wolfgang near Hanau, Germany

Division of Ser. No. 277,103, Aug. 1, 1972, Pat. No. 3,836,311.

This application July 9, 1974, Ser. No. 486,773

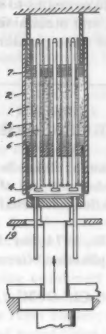
Claims priority, application Germany, Feb. 3, 1972, 2205018

Int. Cl.² G21C *21/00*

U.S. Cl. 264—.5 **6 Claims**

1. In a process for the production of molded block fuel elements of high power for gas cooled high temperature reactors by premolding in a first step a graphite matrix block with axially running channels, then inserting in a part of these channels coated fuel particles to fill the block, and finally molding in a further step said premolded and filled block to obtain the block fuel element, the improvement comprising

providing inner bars and an outer molding die frictionally moveable in the axial direction and a pair of opposed molding punches, moving said punches within said outer die to premold said matrix block in said first step, and to finally mold

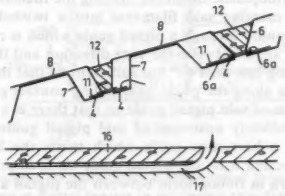


said filled block in said further step, said bars in said first step moving unhindered relative to said punches in accordance with the frictional forces generated between said bars and the graphite matrix block.

3,996,320
METHOD FOR MAKING DOMED SKELETAL STRUCTURES OF CONCRETE

Dante Bini, 5-11 Thornton St., Darling Point, New South Wales, Australia

Filed Nov. 20, 1974, Ser. No. 525,626
Claims priority, application Italy, Dec. 17, 1973, 9017/73
Int. Cl.² E04B 1/16, 1/19
U.S. Cl. 264—32 **4 Claims**

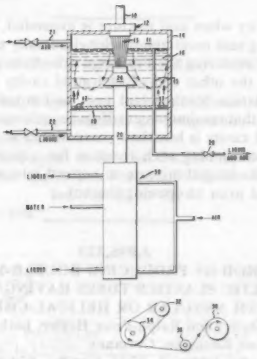


1. A method of making a self-supporting dome-like skeletal structure including the steps of preparing a substantially flat surface, assembling a plurality of first members each having a multi-sided regular shape and a peripheral flange so that said first members are in flange to flange relationship so as to form an array of first members which is criss-crossed by paths comprising adjacent flanges of adjacent first members, placing a substantially straight, elastic continuous strip of pliable material along each path across said array of first members in order to overlie said flanges and cover the joints between said adjacent flanges, interweaving the strips at intersections thereof to form a web of strips, securing the ends of the strips, fastening a second member over and to each of said first members, said second members having the same number of sides and configuration as the first members but being smaller overall than the first members and peripherally sealingly resting on the strips on the flanges of the first members, said fastening clamping said pliable material between the flanges of said first and second members, placing concrete in troughs having as sides the sides of adjacent second members and as bottoms the strips on the flanges of the first members and introducing pressurized gas below said array of first members to cause it to raise and assume a dome-like configuration, the pairs of first and second members moving slightly apart relative to said strips as said array is raised, allowing the concrete in the troughs to set and exhausting the gas from below the first members so as to strip at least said first members from the concrete skeleton so formed.

3,996,321
LEVEL CONTROL OF DRY-JET WET SPINNING PROCESS

Charles Brian Weinberger, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 26, 1974, Ser. No. 527,347
Int. Cl.² D01D 5/14
U.S. Cl. 264—40.3 **3 Claims**



1. In a wet spinning process for forming fibers that includes the steps of extruding a spinning dope from an orifice through a layer of inert gas and through a liquid quench coagulating bath by passing the fiber through a tube in said bath co-currently with a portion of said bath and adding quench liquid to said bath in an amount at least as great as said portion, the improvement comprising: applying a gas pressure to said layer of inert gas; self-regulating the inert gas pressure in said layer; and self-regulating the liquid in said bath at a predetermined level by continuously passing the pressurized inert gas and quench liquid through a restricted pipe having an opening at said level.

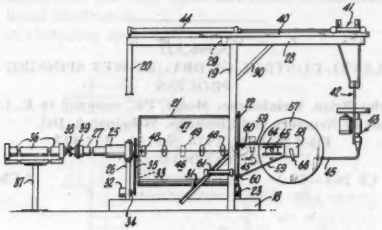
3,996,322
METHOD OF PRODUCING A TUBULAR FOAMED PLASTIC ARTICLE

Charles D. Snelling, Allentown; Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 228,130, Feb. 22, 1972, Pat. No. 3,790,320. This application July 3, 1973, Ser. No. 376,234
Int. Cl.² B29D 27/04; B29C 5/04
U.S. Cl. 264—45.7 **9 Claims**

1. The method of making a tubular article of foamed plastic material, which comprises selecting and horizontally orienting an elongate cupped annular mold closed at one end and openable at the other end by an attachable door having a closeable injection port said mold having elongate inner and outer rigid

cavity walls conforming to the desired bore and outer surface profiles of the article, longitudinally introducing via the discharge end of an elongate discharge tube inserted through said injection port a foamable resin-forming reaction mixture between the inner and outer walls of the mold cavity at a location near the closed end thereof, longitudinally retracting the discharge end of the tube (a) while continuing to discharge into said mold cavity a quantity of said foaming mixture less than the volume of said mold cavity but at least sufficient to



fill said cavity when said mixture is expanded, and (b) while also rotating said mold about a longitudinally extending horizontal axis, removing the discharge tube from said mold cavity, closing the other end of said mold cavity before the expanding mixture reaches said end, said rotation being at a speed such that maximum centrifugal acceleration on material in the mold cavity is less than gravitational acceleration, and thereafter continuing such rotation for a period of time to allow the discharged mixture to expand into and cure in the closed mold prior to opening thereof.

3,996,323

METHOD OF PRODUCING DOUBLE-WALLED SYNTHETIC PLASTICS TUBES HAVING AN OUTER WALL WITH ANNULAR OR HELICAL CORRUGATIONS

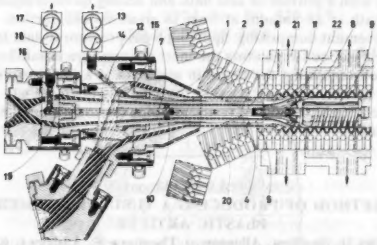
Wilhelm Hegler, and Ralph-Peter Hegler, both of Goethe Str. 2, 873 Bad Kissingen, Germany

Filed Mar. 3, 1975, Ser. No. 554,946

Claims priority, application Germany, Mar. 22, 1974, 2413878

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **9 Claims**



1. In a process of producing a doublewalled synthetic plastic tube having a concentric outer tube and an inner tube wherein an outer tube of molten synthetic plastic is extruded from an annular die and passed into a mold cavity formed by a divided mold having two cooperating endless recirculating trains of mold halves which close to complete the mold cavity, a negative pressure is applied to said outer tube to draw the same against the walls of said mold and an inner tube of molten synthetic plastic is extruded from a die orifice located in the interior of said mold, the improvement which comprises introducing a first gas into the space between said inner tube and said outer tube before said synthetic plastic has fully hardened, said first gas being at a pressure above atmospheric and at a temperature at or above the softening point of said synthetic plastic, a second gas being introduced within said inner tube and adjusting the pressure of said first gas with the pressure of said second gas such that they are substantially the same before said inner tube begins to set permitting said outer and inner tubes to cool and maintaining the first, and second gases at substantially the same pressure until the inner tube is set.

3,996,324

PROCESS FOR PRODUCING ORIENTED CONTINUOUS YARNS

Peter Landenberger, Hanau; Heinz Schuttrichkeit, and Georg Treutel, both of Kelsterbach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 30, 1974, Ser. No. 493,204

Claims priority, application Germany, Sept. 22, 1973, 2347801

Int. Cl.² D02G *1/20*

U.S. Cl. 264—103 **4 Claims**

1. A high speed single step process for producing pre-oriented synthetic yarn comprising melt spinning a plurality of synthetic thermoplastic filaments, cooling the filaments with a cooling gas, merging said filaments into a twisted bundle, sliding said bundle through a pigtail guide which is cocked at an angle, the angle between the yarn direction and the axis of the guide being less than 40° but sufficient so that the bundle actually slides along the guide, said sliding contact producing twist upstream of said pigtail guide so that there is a compact bundle immediately upstream of said pigtail guide, passing said yarn to a horseshoe guide which twists the bundle in opposite direction from the pigtail guide so as to produce an untwisted yarn in ribbon form between the pigtail and horseshoe guides, lubricating the ribbon of filaments between said guides, and downstream of said horseshoe guide for the first time contacting said yarn with an advancing roll, said roll taking up the yarn at a speed of from 2500 to 6000 meters per minute.

3,996,325

PREPARATION OF A THREE LAYER, FIRE RETARDANT PARTICLEBOARD

Robert A. Megraw, Seattle, Wash., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 112,778, Feb. 4, 1971, abandoned. This application May 28, 1974, Ser. No. 474,001

Int. Cl.² B29J *5/00*; D21J *1/08*, *1/16*

U.S. Cl. 264—113 **1 Claim**

1. A method of preparing a composite, flame retardant particleboard from cellulosic furnish comprising the steps of:

impregnating a first portion of cellulosic furnish consisting

essentially of bark with an aqueous solution of diammonium phosphate whereby said first portion of bark, when dried to oven dry moisture content, contains approximately 14 percent diammonium phosphate by weight;

mixing said first portion containing diammonium phosphate with a second portion of cellulosic furnish consisting essentially of bark, said second portion being untreated with a fire retardant substance, the mixed first and second portion comprising approximately 60% by weight untreated bark and 40% by weight treated bark and being combined with about 8 percent by weight urea formaldehyde resin binder;

impregnating a third portion of cellulosic furnish consisting essentially of wood chips with an aqueous solution of diammonium phosphate whereby said third portion of chips, when dry to oven dry moisture content, contains from about 20 to about 40 percent by weight diammonium phosphate;

mixing said third portion of furnish containing diammonium phosphate with a fourth portion of furnish consisting essentially of wood chips, said fourth portion being untreated with a fire retardant substance, said third and said fourth portions being combined in approximately equai amounts and then mixed with about 8 percent by weight urea formaldehyde resin binder; and then

forming the combined wood chips and combined bark into a three layer composite board having a bark core and wood chip surface by pressing and heating whereby a particleboard is formed having improved fire retardancy without substantial degradation of the strength of said board due to the presence of the fire retardant material in a portion of the furnish forming the completed board.

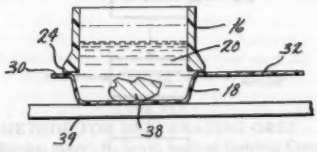
3,996,326
METHOD OF EMBEDDING A HISTOLOGY SPECIMEN

Eli Schachet, St. Louis, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 379,892, July 26, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,507

Int. Cl.² B29C *5/00, 17/08*

U.S. Cl. 264—158 **14 Claims**



1. A method of embedding a histological tissue specimen in embedding material for use in preparing a section of the specimen for microscopic analysis comprising the steps of providing a mold having an upper mold portion with upper and lower open ends, and a lower mold portion having an open upper end and a closed lower end, a body of solidified meltable specimen embedding material disposed in said mold, and cover means connected to the mold closing the upper end of the upper mold portion to prevent the entrance of foreign matter into the mold, with the solidified embedding material opening the upper end portion of the mold to permit access to the interior of the mold, heating the embedding material while in the mold to melt the same to a liquid, thereafter placing a specimen into the melted embedding material adjacent the closed end of said lower mold portion, cooling the embedding material to solidify the same, and removing said lower mold portion from the solidified embedding material to provide a block of embedding material adhering to said upper mold portion with a lower portion of said block extending from the lower end thereof and having the specimen embedded therein.

3,996,327
PROCESS FOR SPINNING COMPOSITE FIBER OF PHENOLIC RESIN

Koichiro Ohtomo, Takatsuki, and Thuyoshi Nakamori, Osaka, both of Japan, assignors to Nippon Kynol Inc., Osaka, Japan

Continuation of Ser. No. 424,696, Dec. 14, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 621,846

Claims priority, application Japan, Dec. 20, 1972, 47-127905; Oct. 15, 1973, 48-115511

Int. Cl.² B29F *3/10*

U.S. Cl. 264—168 **18 Claims**

1. A method of producing a self-crimping phenolic composite fiber having heat-resistant and flameproof properties, said method comprising melt-spinning (A) a modified phenolic resin obtained by melt blending a heat-meltable uncured novolak resin with 0.5 –30 % by weight, based on the total weight of the mixture, of a heat-metable fiber-forming resin selected from polyamide resin, polyester resin, polyurethane resin or polyolefin resin, and (B) a heat-meltable uncured novolak resin, said melt-spinning being carried out such that the components (A) and (B) are united in an eccentric or side-by-side relationship, and thereafter curing the phenolic resin component contained in the resulting heat-meltable composite fiber.

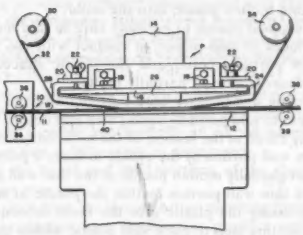
3,996,328
METHOD FOR FINISHING RESINOUS SURFACE COVERINGS

Robert E. Coffin, Wayne, and Anthony N. Piacente, Lawrenceville, both of N.J., assignors to Congoleum Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 24,519, April 1, 1970, abandoned. This application Feb. 17, 1972, Ser. No. 227,190

Int. Cl.² B29D *7/14*

U.S. Cl. 264—280 **10 Claims**



1. A method for finishing resinous sheet material in a thermoplastic state comprising:

a. adhering the resinous sheet material to a carrier support web, to which said resinous sheet material will adhere and from which it can be stripped, by pressing said resinous sheet material against said web at an elevated temperature within the range of 100° –375° F at which said resinous sheet material is heat softened,

b. moving said adhered resinous sheet material and said carrier support web between a smooth, resiliently backed stationary finishing surface and a stationary support surface so that said finishing surface contacts the surface of said adhered resinous sheet material,

c. forming a pressure nip between said surfaces by applying a pressure force perpendicular to said sheet material,

d. maintaining the surface of said resinous sheet material at a temperature at which it is in a thermoplastic state while being moved through said pressure nip without the addition of heat to the resinous sheet material at said pressure nip,

e. whereby said perpendicularly applied pressure force causes the material closest to the surface of said resinous sheet material to be displaced longitudinally from the

material just below it thereby producing a plastic deformation of the surface of said sheet material by the sliding action of the surface of the sheet material relative to the material directly below it,

f. cooling said resinous sheet material subsequent to movement through said pressure nip, and

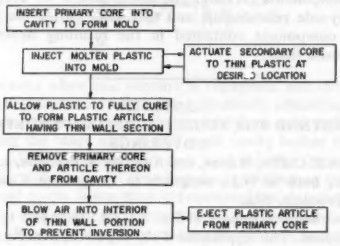
g. stripping said resinous sheet material from said carrier support web subsequent to said cooling.

3,996,329

TWO-STEP INJECTION MOLDING

Charles M. Holland, San Lorenzo, and Lawrence W. Parrack, Hayward, both of Calif., assignors to Misto & Gen Equipment Co., Oakland, Calif.

Filed Jan. 20, 1975, Ser. No. 542,332
Int. Cl.² B29F *1/14*
U.S. Cl. 264—296 **6 Claims**


INSERT PRIMARY CORE INTO CAVITY TO FORM MOLD
INJECT MOLTEN PLASTIC INTO MOLD
ACTUATE SECONDARY CORE TO THIN PLASTIC AT DESIR. LOCATION
ALLOW PLASTIC TO FULLY CURE TO FORM PLASTIC ARTICLE HAVING THIN WALL SECTION
REMOVE PRIMARY CORE AND ARTICLE THEREON FROM CAVITY
BLOW AIR INTO INTERIOR OF THIN WALL PORTION TO PREVENT INVERSION
EJECT PLASTIC ARTICLE FROM PRIMARY CORE

1. A method for forming plastic articles having a relatively thin wall portion, said method comprising the steps of:

forming a mold;

injecting molten plastic into the mold;

allowing said plastic to partially cure in said mold until the surfaces of said plastic in contact with the mold are at least partially cured and the plastic spaced from said surfaces is at least partially molten;

projecting a secondary core partially into the mold subsequent to said partially curing step and before the plastic is fully cured at the section of the mold adapted to form the thin wall portion of the article to force a portion of the at least partially molten plastic at the thin wall portion from said thin wall portion to thin the plastic at said section;

compressing the plastic into the mold subsequent to said projecting step to pack said plastic within the mold; and

thereafter allowing the plastic to fully cure to form the article.

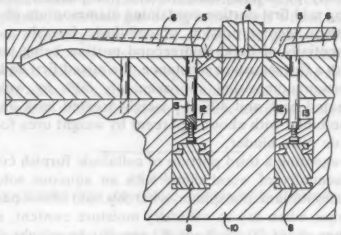
3,996,330

METHOD OF MAKING A MOLDED BRUSH BACK

Kenneth B. Jones, and Walter C. Gorenflo, both of Easthampton, Mass., assignors to Vistron Corporation, Cleveland, Ohio

Division of Ser. No. 507,768, Sept. 20, 1974, Pat. No. 3,936,261. This application Oct. 23, 1975, Ser. No. 625,205
Int. Cl.² B29C *5/00*; B29F *1/05*
U.S. Cl. 264—328 **3 Claims**

1. The process of making a finished brush back, comprising: injecting a plastified thermoplastic material into a cavity of a mold through a tunnel gate communicating with said cavity, moving a punch pin into said gate until an end of said pin is flush with an inner surface of a wall of said mold defining said cavity, to force thermoplastic material from said gate into said cavity, accomplishing said moving by moving horizontally one wedge of a pair of cooperating wedges to actuate a second wedge of said pair causing it to move transversely to the direction of movement of said first wedge, said second wedge actuating said pin, while preventing movement of said second wedge, in a direction parallel to the direction of movement of said first wedge, by movably receiving a guide pin in an aperture therein.

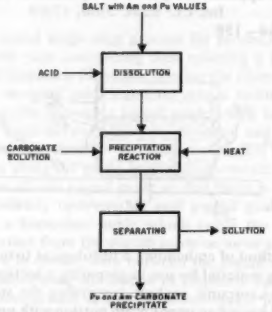


3,996,331

PLUTONIUM AND AMERICIUM SEPARATION FROM SALTS

Paul G. Hagan, Northglenn, and Frend J. Miner, Boulder, both of Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 24, 1975, Ser. No. 589,808
Int. Cl.² C01G *56/00*
U.S. Cl. 423—18 **10 Claims**



1. A process for separating plutonium and americium from an acid solution comprising hydrochloric acid and containing plutonium and americium comprising contacting said acid solution with an alkali metal carbonate solution comprising sodium carbonate, to effect formation of a plutonium carbonate and an americium carbonate as precipitates, and separating said precipitates from said solution.

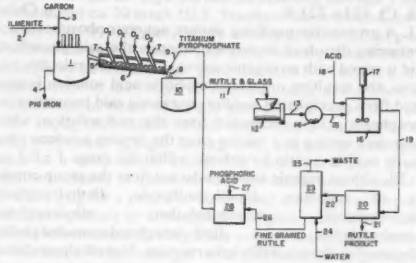
5. A process for extracting and recovering plutonium and americium values from salt compositions containing said values and resulting from molten salt plutonium treating processes comprising dissolving said salts in hydrochloric acid to form an acid solution, contacting said acid solution with a metal carbonate solution comprising sodium carbonate, to effect formation of a precipitate of plutonium carbonate and americium carbonate, and separating said precipitate from said acid solution and said carbonate solution.

3,996,332

SYNTHESIS OF RUTILE FROM TITANIFEROUS SLAGS

Gerald W. Elger, and Donald E. Kirby, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 2, 1975, Ser. No. 636,879
Int. Cl.² C01G 23/04
U.S. Cl. 423—69 13 Claims



1. A method for synthesizing rutile from a titaniferous slag containing at least 60 wt-pct titanium oxides and less than 10 wt-pct ferrous oxide which comprises:

oxidizing the slag to convert substantially all lower titanium oxides to TiO_2;

mixing with the slag a titanium pyrophosphate flux in an amount ranging from 2 to 10 wt-pct P_2O_5 equivalent based upon slag weight;

aging the mixture at a temperature above 1200° C for a time sufficient to grow rutile crystals and to form a phosphate glass matrix, and

separating rutile crystals from said phosphate glass matrix.

3,996,333

METHOD FOR DEHYDRATING ORES

Philip M. Rooke; Harry B. Scott, both of Golden, Colo.; Peter A. Angevine, Ridgefield, and Stanley A. Bunk, Greenwich, both of Conn., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed Aug. 28, 1975, Ser. No. 608,557
Int. Cl.² C01F 7/02
U.S. Cl. 423—120 7 Claims

1. A continuous method for dehydrating alunite mineral which comprises:

a. introducing the alunite mineral in particulate form into a fluidized bed fluidized by air;

b. introducing particulate coal having a combustion temperature below about 625° C into the fluidized bed at a temperature maintained up to about 625° C to combust the coal;

c. controlling the rate of introduction of air into the fluidized bed to provide about 20–40% excess oxygen for completely burning all the coal present in the bed, and

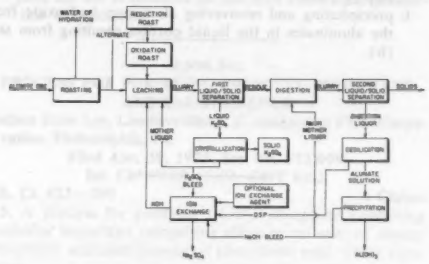
d. maintaining the particulate alunite in the fluidized bed in the presence of the burning coal a sufficient time to substantially dehydrate the alunite.

3,996,334

PROCESS FOR RECOVERING ALUMINUM FROM ALUNITE

George J. Hartman, Arvada, and Vernon R. Ewing, Denver, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed June 2, 1975, Ser. No. 582,806
Int. Cl.² C01F 7/06; C01D 5/00
U.S. Cl. 423—127 9 Claims



1. A process for recovering aluminum hydroxide from alunite ore comprising the following steps:

a. roasting the ore to remove water and leaching the roasted ore with an alkaline solvent or water to remove compounds of sulfur and alkali metals including potassium sulfate resulting in a residue containing aluminum values and a solution containing potassium sulfate;

b. separating the residue and solution of step (a);

c. recovering potassium sulfate from the solution of (b) by crystallization while bleeding off a portion of potassium sulfate from the mother liquor;

d. contacting an anion exchange agent loaded with hydroxyl ions with the potassium sulfate bleed stream to replace said hydroxyl ion with sulfate to form potassium hydroxide and cycling said potassium hydroxide to the leaching of step (a);

e. digesting the residue from step (b) with at least one alkali metal hydroxide at a concentration and at a temperature sufficient to dissolve substantially all of the aluminum values from said solid portion as aluminates;

f. separating the liquid and solid portions of the slurry resulting from step (e);

g. removing silica from the liquid portion resulting from step (f) by precipitation as a desilication product which is essentially sodium aluminum silicate;

h. separating the liquid and solid portions resulting from step (g), and

i. precipitating and recovering aluminum hydroxide from the aluminates in the liquid portion resulting from step (h).

5. A process for recovering aluminum hydroxide from alunite ore comprising the following steps:

a. roasting the ore to remove water and leaching the roasted ore with an alkaline solvent or water to remove compounds of sulfur and alkali metals including potassium sulfate resulting in a residue containing aluminum values and a solution containing potassium sulfate;

b. separating the residue and solution of step (a);

c. recovering potassium sulfate from the solution of (b) by crystallization while bleeding off a portion of potassium sulfate from the mother liquor;

d. contacting the potassium sulfate bleed stream with a cation exchange agent loaded with sodium ions to exchange potassium ions for sodium ions on the agent followed by contacting the potassium loaded agent with sodium hydroxide to exchange sodium ions for potassium ions on the agent to form potassium hydroxide and recycling said potassium hydroxide to the leaching of step (a);

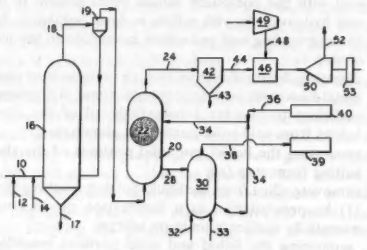
e. digesting the residue from step (b) with at least one alkali metal hydroxide at a concentration and at a temperature sufficient to dissolve substantially all of the aluminum values from said solid portion as aluminates;
f. separating the liquid and solid portions of the slurry resulting from step (e);
g. removing silica from the liquid portion resulting from step (f) by precipitation as a desilication product which is essentially sodium aluminum silicate;
h. separating the liquid and solid portions resulting from step (g), and
i. precipitating and recovering aluminum hydroxide from the aluminates in the liquid portion resulting from step (h).

3,996,335

DESULFURIZATION OF FUEL GAS AT HIGH TEMPERATURE USING SUPPORTED MOLTEN METAL CARBONATE ABSORBENT

Ronald H. Wolk, San Jose, Calif.; William C. Rovesti, Columbia, S.C., and Peter Maruhnic, Pennington, N.J., assignors to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Apr. 14, 1975, Ser. No. 567,635
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210.5 12 Claims



1. A process for removing hydrogen sulfide from a fuel gas mixture comprising the steps of:
a. contacting the fuel gas mixture in a reaction zone with a particulate porous refractory material containing a molten alkali metal carbonate interspersed in the pores of the refractory material, the reaction zone being maintained at a temperature above melting point of the metal carbonate, and pressures between about 15 and 600 psig, the refractory material being substantially non-reactive with the metal carbonate at said temperature, and having a SiO_2 content less than 2.0 weight percent, whereby the hydrogen sulfide in the gas mixture chemically reacts with the metal carbonate, thereby forming a metal sulfide;
b. withdrawing from the reaction zone a low sulfur-containing gas stream;
c. removing a portion of the refractory material from contact with the fuel gas; and
d. regenerating the refractory material with CO_2 and steam at temperatures above the melting point of the metal sulfide but below the temperature at which metal sulfide formation is kinetically favored, thereby converting the metal sulfide to a metal carbonate for reuse.

3,996,336

PURIFICATION OF PHOSPHORIC ACID

Bernhard Wojtech, Bad Soden; Klaus-Peter Ehlers, Erftstadt Lechenich, and Wolfgang Scheibitz, Cologne, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 1, 1975, Ser. No. 592,188
Claims priority, application Germany, July 6, 1974, 2432472; July 25, 1974, 2435789
Int. Cl.² C01B *25/16*
U.S. Cl. 423—321 S 6 Claims

1. A process for purifying impure aqueous phosphoric acid containing dissolved impurities, wherein the said phosphoric acid is mixed with an organic solvent completely miscible with water, the resulting organic phosphoric acid solution is separated from precipitated residue containing said impurities and phosphoric acid is recovered from the said solution, which comprises mixing in a mixing zone the impure aqueous phosphoric acid in a ratio by volume within the range 1 : 0.3 and 1 : 30, with an organic solvent selected from the group consisting of sulfolane, dimethylsulfoxide, diethyleneglycol, ethyleneglycol- monoethylether, ethyleneglycol-monobutylether, diethyleneglycol-monobutylether, ethyleneglycolmonomethyletheracetate, N-methylpyrrolidone and 3-methoxybutanol, heating the resulting mixture to its boiling point for as long a period as necessary to distil off essentially all of the free water contained therein; and separating the resulting organic phosphoric acid solution from the precipitated residue and recovering purified phosphoric acid from the organic phosphoric acid solution.

3,996,337

CRYSTALLINE BERYLLO-ALUMINO-SILICATES AND PROCESS FOR THEIR MANUFACTURE

Joachim Stabenow, Weinheim; Laszlo Marosi, Ludwigshafen, and Matthias Schwarzmann, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 14, 1974, Ser. No. 469,802
Claims priority, application Germany, May 18, 1973, 2325228
Int. Cl.² C01B *33/28*
U.S. Cl. 423—328 1 Claim

1. Crystalline beryllo-alumino-silicates having the molar composition:

$$X\ M_{2/n}O\ .\ Al_2O_3\ .\ Y\ SiO_2\ .\ Z\ BeO\ .\ W\ H_2O$$

in which M denotes at least one exchangeable cation and n is its valency and the coefficients have the following values: X from 0.8 to 11.2, Y from 10 to 120, Z from 0.01 to 10 and W from 0 to 7, and also having an X-ray diffraction pattern having at least the following d-values in angstrom units:

d (A)
13.50 ± 0.25
10.00 ± 0.25
9.00 ± 0.25
6.50 ± 0.20
6.40 ± 0.20
6.00 ± 0.20
5.80 ± 0.20
4.50 ± 0.15
4.00 ± 0.15
3.47 ± 0.15
3.39 ± 0.1
3.21 ± 0.1
3.19 ± 0.1

3,996,338

SILICA XEROGEL

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,437, Dec. 17, 1973, Pat. No. 3,917,721. This application July 9, 1975, Ser. No. 594,422

Int. Cl.² C01B *33/16*

U.S. Cl. 423—335 5 Claims

1. A water vapor treated, intermediate density silica xerogel, said xerogel having a particle size passing through 3 mesh and retained on 20 mesh (U.S. Standard Sieve Series), a bulk density of 0.38–0.48 g/cc, a pore volume of 0.80–2.2 ml/g with a substantial proportion of said pore volume contributed by micropores having average pore diameter 600A, a BET surface area in the range of 200–500, m^2/g and a chemical composition in terms of weight percent dry basis: SiO_2 over 99%, Fe_2O_3 0.01–0.03%, Na_2O 0.02–0.09% and Al_2O_3 less than 0.4%, said xerogel having been contacted with water vapor at a temperature above 100° and below 200° C at a relative humidity of about 30 to 100% and a total pressure of 20–1500 psig for a period of from about 4 to 16 hours, cooled and depressurized to atmospheric pressure, said water vapor treated intermediate density silica xerogel being characterized by increased crush strength with retention of a substantial proportion of microporosity.

3,996,339

METHOD FOR THE CHEMICAL CONVERSION IN GAS MIXTURES

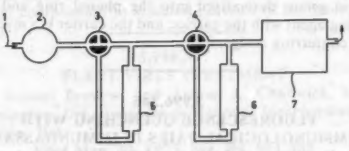
Rudy André Falkenburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1974, Ser. No. 529,124

Claims priority, application Netherlands, Dec. 4, 1973, 7316555

Int. Cl.² C01B *21/24;* C09K *3/00;* G01N *31/00*

U.S. Cl. 423—405 2 Claims



1. In a method for the chemical conversion of NO_2 in a gas mixture to NO by reduction by passing the gas mixture through a container filled with an inorganic reducing composition, the improvement wherein said inorganic reducing composition is a mixture of ferrous sulfate and an alkali metal acid sulfate in a molar ratio of between 3:1 and 1:1.

3,996,340

METHOD OF PRODUCING ALUMINUM FLUORIDE

Fredrik Steineke, Trondheim, Norway, assignor to Elkem-Spigerverket, Oslo, Norway

Continuation-in-part of Ser. No. 416,375, Nov. 16, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,434

Claims priority, application Norway, Dec. 12, 1972, 4575/72

Int. Cl.² C01B *9/08*

U.S. Cl. 423—489 7 Claims

1. The method of disposing of the silica dust recovered from the smoke of metallurgical processes for the production of metallic silicon or alloys having a high silicon content by using it to make a product which can be used in furnaces for the melt electrolytic production of aluminum comprising:

a. recovering amorphous silica dust from the smoke of metallurgical processes for the production of metallic silicon or alloys having a high silicon content said silicon dust having an average diameter of no greater than about 1 micron;

b. admixing fluorspar with said silica dust in a ratio of from about one to about three parts calcium fluoride per part of said silica dust;

c. treating the fluorspar-silica dust mixture with a gas-stream mixture at a temperature of from about 1,000° to about 1,200° C. whereby hydrogen fluoride-containing gases are evolved;

d. bringing the hydrogen fluoride-containing gases into contact with aluminum oxide whereby at least part of the hydrogen fluoride reacts to form aluminum fluoride suitable for use in furnaces for the melt electrolytic production of aluminum.

3,996,341

PROCESS FOR PURIFYING TRIOCTYL PHOSPHATE AND USE THEREFOR

Nathan Dean Lee, Lambertville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 30, 1975, Ser. No. 573,099

Int. Cl.² C01B *15/02;* C07F *9/02*

U.S. Cl. 423—589 6 Claims

5. A process for purifying trioctyl phosphate containing emulsifier impurities comprising alkali metal salts of dioctyl phosphoric acid and monooctyl phosphoric acid, which comprises:

a. contacting said trioctyl phosphate with a sufficient amount of an aqueous mineral acid solution consisting essentially of sulfuric acid, phosphoric acid and nitric acid to neutralize the emulsifier impurities and to provide a two-phase system having an organic phase and an aqueous phase wherein the pH value of the aqueous phase is between 0.5 and 3.0;

b. separating the organic phase from the aqueous phase and removing entrained and dissolved water from the organic phase which phase contains trioctyl phosphate and neutralized impurities comprising dioctyl phosphoric acid and monooctyl phosphoric acid; and

c. contacting the organic phase with an absorbent material selected from the group consisting of activated alumina, silice gel, high surface area silica, zeolites, and activated magnesia whereby the neutralized impurities are absorbed leaving a substantially pure trioctyl phosphate having an interfacial tension of about 18 to about 24 dynes/cm.

3,996,342

METHOD FOR THERMOCHEMICAL PRODUCTION OF HYDROGEN FROM WATER

Hiroshi Ishikawa, Ikeda; Masanori Nakane, Takatsuki; Eiichi Ishii, and Yoshizo Miyake, both of Toyonaka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,662

Claims priority, application Japan, Sept. 5, 1974, 49-102767; Dec. 17, 1974, 49-145475; Dec. 18, 1974, 49-146169

Int. Cl.² C01B *1/02, 1/04*

U.S. Cl. 423—657 4 Claims

1. A method for the production of hydrogen by the thermochemical decomposition of water, which method comprises:

a. preparing a mixture of barium carbonate and ammonium iodide by reacting barium iodide, carbon dioxide, ammonia and water;

b. reacting the barium carbonate obtained in step (a) with iodine, thereby producing barium iodide, carbon dioxide and oxygen;

c. thermally decomposing the ammonium iodide obtained in step (a), thereby producing hydrogen, iodine and ammonia;

d. recycling the barium iodide and carbon dioxide obtained in step (b) to step (a);

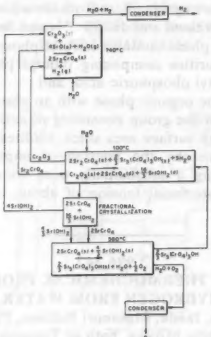
e. recycling the ammonia obtained in step (c) to step (a); and

f. recycling the iodine obtained in step (c) to step (b).

3,996,343
PROCESS FOR THERMOCHEMICALLY PRODUCING HYDROGEN

Carlos E. Bamberger, and Donald M. Richardson, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 647,463
Int. Cl.² C01B *1/02, 13/02;* **C01G** *37/02, 37/00*
U.S. Cl. 423—657 **4 Claims**



1. A thermochemical process for splitting water to produce hydrogen, comprising the steps of:

reacting (1) chromium sesquioxide with strontium oxide and water to produce strontium orthochromate IV and hydrogen as reaction products;

separating said hydrogen as a product of reaction;

reacting (2) said strontium orthochromate IV and strontium hydroxychromate V with water to produce chromium sesquioxide, strontium chromate and strontium hydroxide as products;

reusing the thus produced chromium sesquioxide in said first mentioned step of reacting;

reacting (3) said strontium chromate with a portion of said strontium hydroxide to produce strontium hydroxychromate V, water and oxygen as products;

separating said oxygen as a product;

reusing said strontium hydroxychromate V as a reactant in said second mentioned step of reacting; and

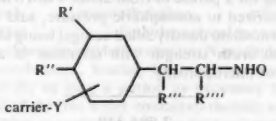
reusing the remaining portion of said strontium hydroxide to fulfill the strontium oxide requirement of said first mentioned step of reacting.

3,996,344
PHENETHYLAMINE ANTIGENIC CONJUGATES, THEIR PREPARATION, ANTIBODIES AND USE

Stanley Joseph Gross, Encino, Calif., assignor to Biological Developments, Inc., Encino, Calif.

Continuation-in-part of Ser. No. 253,632, May 15, 1972, Ser. No. 462,517, April 19, 1974, Ser. No. 160,559, July 7, 1971, and Ser. No. 480,097, June 17, 1974, said Ser. No. 253,632, is a continuation-in-part of Ser. No. 89,929, Nov. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,558, June 11, 1970, abandoned, said Ser. No. 462,517, is a continuation of said Ser. No. 89,929, said Ser. No. 160,559, is a continuation-in-part of said Ser. No. 89,929, said Ser. No. 480,097, is a continuation of Ser. No. 160,150, July 6, 1971, which is a continuation-in-part of said Ser. No. 89,929. This application Dec. 10, 1974, Ser. No. 531,220
Int. Cl.² G01N *33/00;* **A61K** *39/00;* **G21H** *5/02*
U.S. Cl. 424—1.5 **21 Claims**

1. A synthetic antigen of formula:



where R′ and R″ of the phenethylamine hapten are individually selected from the class consisting of —H, —OH, and $-OCH_3$, where when either R′ or R″ is $-OCH_3$ the other is —OH; R‴ of the phenethylamine hapten is selected from the class consisting of —H and —OH; R⁗ of the phenethylamine hapten is selected from the class consisting of —H, $-OCH_3$, and $-C_2H_5$; Q of the phenethylamine hapten is selected from the class consisting of —H and $-CH_3$; Y is a linking group which is the residue of the reaction of a coupling agent with a reactive group derivatized into the phenol ring and of the coupling agent with the carrier; and the carrier is a macromolecule conferring antigenicity.

3,996,345
FLUORESCENCE QUENCHING WITH IMMUNOLOGICAL PAIRS IN IMMUNOASSAYS

Edwin F. Ullman, Atherton, and Moshe Schwarzberg, Palo Alto, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 497,167, Aug. 12, 1974, abandoned. This application June 30, 1975, Ser. No. 591,386
Int. Cl.² G01N *21/00, 33/16*
U.S. Cl. 424—12 **38 Claims**

1. A method for determining in an assay solution, the presence of a ligand in an unknown suspected of containing said ligand, said ligand having at least one epitopic site, wherein two chromophores, Ch_1 and Ch_2, which form a fluorescer-quencher pair are employed as reagents, whereby in said assay solution the amount of fluorescer brought within quenching distance of said quencher is affected by the presence of ligand, which comprises:

A. combining in an aqueous buffered medium to form an assay solution;

1. said unknown;

2. a source of Ch_1, as Ch_1 covalently bound to a first receptor composition capable of specific non-covalent binding to said ligand;

3. a source of Ch_2, as Ch_2 covalently bound to a second receptor composition capable of specific non-covalent binding to said ligand or as Ch_2 covalently or non-covalently bound to ligand analog, wherein ligand analog is a mono- or polyvalent radical, a substantial proportion of which defines one or more epitopic sites capable of competing with ligand for the binding sites of said receptor;

B. incubating said assay solution for a sufficient time for at least a portion of said receptor compositions to combine with at least a portion of any ligand present;
C. irradiating said incubated assay solution with light at a wavelength within the absorption spectrum of said fluorescer; and
D. measuring the amount of fluorescence from said assay solution as compared to an assay solution having a known amount of ligand.

3,996,346

COMPOSITION FOR REDUCING BODILY ODOR AND PERSPIRATION

Dominic Thomas Staffier, 19 Breed St., East Boston, Mass. 02128; Samuel Louis Shershow, 72 Lancaster Ave., Revere, Mass. 02151, and William Barry Norton, 85 Longmeadow Road, Norwood, Mass. 02062

Filed Mar. 18, 1975, Ser. No. 559,548
Int. Cl.² A61K *7/36*
U.S. Cl. 424—67 **10 Claims**

1. A deodorant and antiperspirant composition in the form of a cream consisting essentially of:
a. from about 12 percent to about 50 percent by total weight of zinc oxide;
b. from about 0.1 percent to about 0.4 percent by total weight of phenol;
c. from about 3 percent to about 18 percent by total weight of glycerin;
d. from about 0.1 percent to about 9 percent by total weight of calcium hydroxide; and
e. from about 30 percent to 94 percent by total weight of a cream base;
f. predetermined proportions of said zinc oxide and said phenol being combined in the form of zinc phenate;
g. said zinc oxide, phenol, glycerin and calcium hydroxide characterizing a deodorant and antiperspirant composition, said cream base constituting a vehicle for applying said composition to selected portions of the body.

3,996,347

PLANT VIRUS TREATMENT

David Samuel Breslow, and Arthur A. Chadwick, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 20, 1975, Ser. No. 561,395
Int. Cl.² A61K *31/80, 31/78, 31/755*
U.S. Cl. 424—78 **17 Claims**

1. A process of suppressing plant virus growth in plants which comprises applying to the foliage of said plants a plant virus inhibiting amount of at least one agent selected from the copolymers of maleic acid, maleic anhydride or fumaric acid with a monomer selected from 1) divinyl ether; 2) allyl esters of monocarboxylic aliphatic acids containing 1 to 17 carbon atoms in the aliphatic chain; and 3) olefins having the formula

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-R'$$

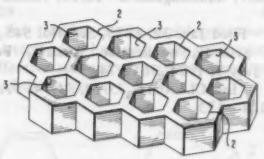
where R is a radical selected from hydrogen, $C_{1\text{-}18}$ alkyl, aryl containing 1 to 2 rings, alkyl substituted aryl containing 1 to 2 rings and 1 to 12 carbon atoms in the alkyl group, $C_{3\text{-}12}$ cycloalkyl, and the above defined R radicals substituted with chloro, bromo and fluoro substituents R′ is a radical selected from $C_{1\text{-}18}$ alkyl, aryl containing 1 to 2 rings, alkyl substituted aryl containing 1 to 2 rings and 1 to 12 carbon atoms in the alkyl group, $C_{3\text{-}12}$ cycloalkyl, and the above defined R′ radicals substituted with chloro, bromo and fluoro substituents; and R + R′ contain no more than 18 carbon atoms; their half-amide--half-acids or half-amide--half-nonphytotoxic salts; their partially or completely hydrolyzed esters; and their nonphytotoxic salts.

3,996,348

INSECT-COMBATTING DEVICE

Jack Greenberg, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 417,704, Nov. 20, 1973, Pat. No. 3,918,407. This application Oct. 31, 1975, Ser. No. 627,671
Int. Cl. A01n *9/36, 17/00*
U.S. Cl. 424—78 **11 Claims**



9. A method of controlling insects which comprises:
providing a discrete body comprising a mixture of a synthetic resin, from between about 15 to 35% by weight of said strip of naled and a spew retarding amount of finely divided silica particles and at least one C_{14} to C_{20} saturated aliphatic carboxylic acid or a salt or ester thereof; said body being formed from a mixture of said synthetic resin, naled, silica particles, saturated aliphatic carboxylic acid and a minor amount of a surface porosity control agent that is non-reactive in the mixture and has a boiling point at or below the curing temperature of said mixture, which mixture is formed into said body at the curing temperature to vaporize said control agent and produce surface porosity in said body to provide for release of naled at a rate to effectively control insects in the vicinity of said body but insufficient to form as droplets on the body; and
placing and maintaining said body in an area in which said insects are to be controlled.

3,996,349

ATTRACTANT COMPOSITIONS

Mir S. Mulla; Yih-Shen Hwang, and Harold Axelrod, all of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed June 18, 1975, Ser. No. 588,085
Int. Cl.² A01N *17/14*
U.S. Cl. 424—84 **7 Claims**

1. An attractant composition for synanthropic flies which comprises an aqueous mixture of 0.1 to 10% tertiary lower alkylamine, 0.1 to 7.0% ammonia, 0.005 to 1% linoleic or oleic acid, 0.001 to 0.1% indole or skatole, and sufficient lower hydrocarbon carboxylic acids to adjust the aqueous mixture to pH 5 to pH 8, said percentages by weight of the total aqueous mixture.

3,996,350

METHODS AND COMPOSITIONS FOR ALLEVIATING FUNGUS INFECTIONS OF THE SKIN

Geraldine Fay Weisz, 2240 Harmain Road, Pittsburgh, Pa. 15235

Continuation-in-part of Ser. No. 537,969, Jan. 2, 1975. This application July 24, 1975, Ser. No. 598,635
Int. Cl.² A61K *33/16*
U.S. Cl. 424—151 **5 Claims**

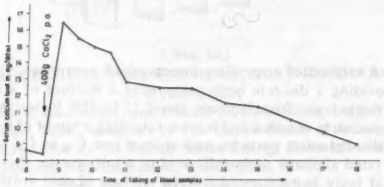
1. The method of alleviating fungus infections of the skin which comprises applying to the skin area affected by the fungus an effective amount of an aqueous solution of a water soluble fluoride and a surface active agent of a character having no substantial effect in inactivating the fluoride, the wetting agent being present in a minor proportion relative to

the fluoride, and said fluoride being present in an amount effective to alleviate said fungus infection.

3,996,351
PROCESS FOR ORALLY INCREASING THE BLOOD CALCIUM LEVEL OF ANIMALS

Klaus Bauer, Taubergasse 66/2/10, Vienna 17, and Franz Sagmeister, Hauslabgasse 8 - 10/11, Vienna 5, both of Austria

Filed Jan. 30, 1975, Ser. No. 545,419
Claims priority, application Austria, Feb. 13, 1974, 1141/74; July 8, 1974, 5617/74
Int. Cl.² A61K *33/14, 31/74, 31/78*
U.S. Cl. 424—153 **4 Claims**



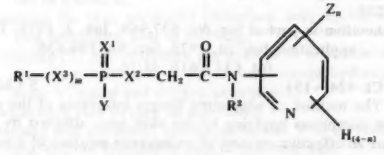
1. In the method of orally administering a liquid composition containing calcium chloride to an animal for increasing the blood calcium level of the animal in need thereof, the improvement which protects the oral cavity of the animal against cauterization comprising orally administering to said animal a mixture of 10–40% by weight of calcium chloride, 5–20% by weight of gel-forming polymer and water, said calcium chloride being solvatized in an aqueous gel of said gel-forming polymer to contain said calcium chloride.

3,996,352
ACARICIDAL COMPOSITIONS OF PHOSPHORAMIDATE ESTERS

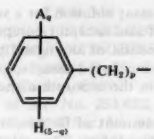
Sidney B. Richter, Chicago, and Leonard J. Stach, Riverside, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation of Ser. No. 433,185, Jan. 14, 1974, abandoned, which is a division of Ser. No. 115,079, Feb. 12, 1971, Pat. No. 3,816,620, which is a division of Ser. No. 778,768, Nov. 25, 1968, Pat. No. 3,632,814. This application May 12, 1975, Ser. No. 576,765
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 **2 Claims**

1. An acaricidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to acarids, a compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl and



wherein A is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, halogen, nitro, diloweralkylamino, lower alkylsulfoxide and lower alkylsulfone, q is an integer from 0 to 5, and p is an integer from 0 to 3; X^1, X^2 and X^3 are independently selected from the group consisting of oxygen and sulfur; m is an integer from 0 to 1; Y is selected from the group consisting of lower alkylamino and diloweralkylamino; R^2 is lower alkyl; Z is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, halogen and nitro; and n is an integer from 0 to 4.

3,996,353
PHOSPHONATED N,N-DISUBSTITUTED FATTY MORPHOLINES AS BACTERIAL AND FUNGICIDAL AGENTS

Robert R. Mod, New Orleans; James A. Harris, Pearl River; Jett C. Arthur, Jr.; Frank C. Magne, both of Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 335,860, Feb. 26, 1973, Pat. No. 3,911,120. This application July 10, 1975, Ser. No. 594,896
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 **5 Claims**

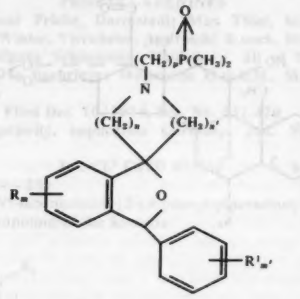
1. A process for inhibiting fungal growth, comprising contacting said fungus with an effective fungal growth inhibitory amount of a phosphonated N,N-disubstituted fatty amide selected from the group consisting of:
N-[9(10)-Dibutylphosphonooctadecanoyl]-2,6-dimethylmorpholine,
N-[9(10)-Dibutylphosphonooctadecanoyl]-N′-methylpiperazine,
N-[9(10)-Dibutylphosphonooctadecanoyl]morpholine, and
N-[11-Dibutylphosphonoundecanoyl]morpholine.

3,996,354
1,3-DIHYDRO-1′-DIMETHYLPHOSPHINYLALKYL-3-PHENYLSPIRO(ISOBENZOFURAN)S

Solomon S. Klioze, Flemington, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed Jan. 26, 1976, Ser. No. 652,150
Int. Cl.² C07D *491/10*
U.S. Cl. 424—200 **19 Claims**

1. A compound of the formula



wherein R and R^1 are hydrogen, lower alkyl, lower alkoxy, halogen or hydroxy; *m* and *m'* are the integers 1 or 2; *n* and *n'* are integers from 1 to 3 with the sum of *n* and *n'* being 3,4 or 5; *p* is an integer from 1 to 4; and the pharmaceutically acceptable acid addition salts and hydrates thereof.

19. A anti-depressant composition which comprises between about 0.5 and 70 percent by weight of a compound defined in claim 1 as an active ingredient, the balance being a pharmaceutically acceptable carrier therefor.

3,996,355

PERMANENT SUSPENSION PHARMACEUTICAL DOSAGE FORM

Song-Ling Lin, and Maturu K. Pramoda, both of Rouses Point, N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,867
Int. Cl.² A61K *31/63, 31/43*
U.S. Cl. 424—228 **5 Claims**

1. An anhydrous pharmaceutical vehicle suitable for oral administration of a water sensitive drug permanently suspended therein, said vehicle consisting essentially of:

a. about 5 to about 60 percent by weight of a sugar suspending agent selected from the class consisting of sucrose, lactose, fructose, glucose, mannitol, and sorbitol;

b. about 0.1 to about 5 percent by weight of a pharmaceutically acceptable silica thickening agent having a particle size of about 2 to about 4 microns, an alkaline pH (5 percent slurry in water) no higher than 8, and an oleophilicity of about 1;

c. the remainder being a pharmaceutically acceptable vegetable oil comprising monoglyceride diglyceride or triglyceride of a saturated fatty acid containing 14 to 22 carbon atoms or monoglyceride, diglyceride or triglyceride of an unsaturated fatty acid containing 14 to 22 carbon atoms.

3,996,356

COMPOSITION CONTAINING 5-SULFANILAMIDO-3,4-DIMETHYLISOXAZOLE AND A TRIMETHOXYBENZYL PYRIMIDINE

Emanuel Grunberg, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 838,635, July 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 614,008, Feb. 6, 1967, abandoned. This application Jan. 14, 1972, Ser. No. 217,959
Int. Cl.² A61k *27/00*
U.S. Cl. 424—229 **5 Claims**

1. An antibacterial therapeutic composition comprising from about 8 to about 30 parts of sulfonamide selected from the group consisting of 5-sulfanilamido-3,4-dimethylisoxazole and a pharmaceutically acceptable salt thereof with a suitable base and one part of a pyrimidine selected from the group consisting of 2,4-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine and a pharmaceutically acceptable salt thereof with a suitable acid.

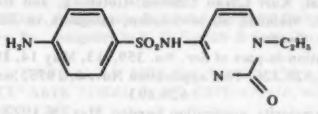
3,996,357

ANTIBACTERIAL COMPOSITIONS

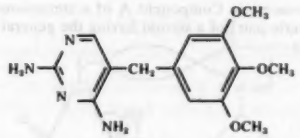
Erika Bohni, and Marc Montavon, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 3, 1974, Ser. No. 529,179
Int. Cl.² A61K *31/625*
U.S. Cl. 424—229 **4 Claims**

3. A method for treating antibacterial infections which comprises administering to a host requiring such treatment an antibacterially effective amount of a composition comprising the sulfonamide of the formula



or a pharmaceutically acceptable salt thereof with a strong base and a sulfonamide potentiator of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein the weight ratio of sulfonamide to sulfonamide potentiator is in the range of from 1:1 to 40:1.

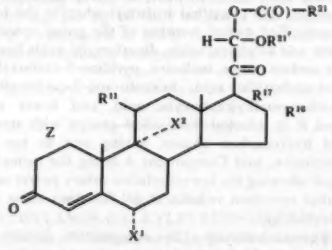
3,996,358

21-ESTERS OF STEROIDAL-21-ALDEHYDE HYDRATES AND 21-ALDEHYDE HEMIACETALS AND METHODS OF PREPARATION

Michael Marx, Sunnyvale, and Denis John Kertesz, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed July 7, 1975, Ser. No. 593,578
Int. Cl.² C07J *5/00*
U.S. Cl. 424—241 **17 Claims**

1. A compound of the formula



(IA)

wherein R^{11} is chloro or hydroxy; R^{16} independently is methyl; R^{17} independently is hydroxy or acyloxy having 2 to 8 carbon atoms or R^{16} and R^{17} taken together are 16α,17α-isopropylidenedioxy; R^{21} is hydrogen, lower alkyl having 1 to 8 carbon

atoms or phenyl; X^1 and X^2 are independently hydrogen, chloro or fluoro, with the proviso that when R^{11} is chloro, X^2 is chloro; R^{21} is lower alkyl having 1 to 8 carbon atoms; and Z is a single or double bond.

3,996,359

NOVEL STEREOISOMERIC COMPONENT A OF STEREOISOMERIC MIXTURES OF 2'-UNSYMMETRICAL 16,17-METHYLENEDIOXY STEROID 21-ACYLATES, COMPOSITIONS THEREOF, AND METHOD OF TREATING THEREWITH

Ralph Lennart Brattsand; Bo Thuresson af Ekenstam, both of Molndal; Karl Göran Claeson, Goteborg, and Bror Arne Thalén, Molndal, all of Sweden, assignors to AB Bofors, Bofors, Sweden

Continuation-in-part of Ser. No. 359,913, May 14, 1973, Pat. No. 3,928,326. This application Nov. 6, 1975, Ser. No. 629,493

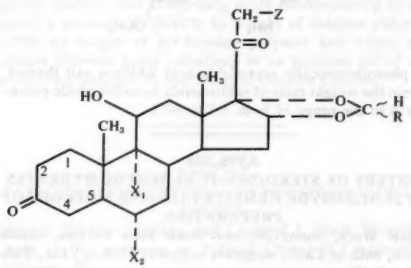
Claims priority, application Sweden, May 19, 1972, 6645/72

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.² A61K *31/58*

U.S. Cl. 424—241 **61 Claims**

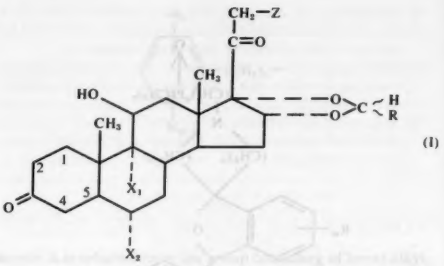
1. Stereoisomeric Component A of a stereoisomeric mixture (isomeric pair) of a steroid having the general formula:



(I)

wherein the 1,2-position is saturated or a double bond is present in that position, a double bond always being present in at least the 4,5-position, X_1 and X_2 are independently selected from hydrogen and fluorine, X_1 being selected from hydrogen and fluorine when X_2 is hydrogen and X_1being fluorine when X_2 is fluorine, Z is esterified hydroxyl wherein the hydroxyl group is esterified with a member of the group consisting of phosphoric and sulphuric acids, dicarboxylic acids having two to twelve carbon atoms, inclusive, pyridine-3-carboxylic acid, pyridine-4-carboxylic acid, benzofurane-2-carboxylic acid, and menthoxymethylcarboxylic acid, and lower alkanoic acids, and R is selected from alkyl groups with straight or branched hydrocarbon chains, having one to ten carbon atoms, inclusive, said Component A being the isomer of the isomer pair showing the lowest relative rotary power or having the smallest retention volume in gel filtration using a cross-linked dextran gel.

16. A pharmaceutically-active composition, suitable for use in the treatment of inflammation, containing as active ingredient an effective antiinflammatory amount of a steroid compound, in combination with a pharmaceutically-acceptable carrier, said steroid compound being the stereoisomeric Component A of a stereoisomeric mixture (isomeric pair) of a 2'-unsymmetrical 16,17-methylenedioxy steriod having the general formula:



(I)

wherein the 1,2-position is saturated or a double bond is present in that position, a double bond always being present in at least the 4,5-position, X_1 and X_2 are independently selected from hydrogen and fluorine, X_1 being selected from hydrogen and fluorine when X_2 is hydrogen and X_1 being fluorine when X_2 is fluorine, Z is esterified hydroxyl wherein the hydorxyl group is esterified with a member of the group consisting of phosphoric and sulphuric acids, dicarboxylic acids having two to twleve carbon atoms, inclusive, pyridine-3-carboxylic acid, pyridine-4-carboxylic acid, benzofurane-2-carboxylic acid, and menthoxymethylcarboxylic acid, and lower alkanoic acids, and R is selected from alkyl groups with straight or branched hydrocarbon chains, having one to ten carbon atoms, inclusive, said Component A being the isomer of the isomer pair showing the lowest relative rotary power or having the smallest retention volume in gel filtration using a cross-linked dextran gel.

3,996,360

PIPERAZINE COMPOUNDS

Richard Cyrus, Ludwigshafen (Rhine), and Manfred Raschack, Weisenheim am Sand, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen, Germany

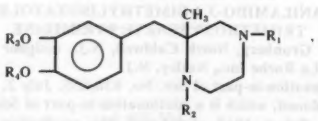
Filed July 31, 1975, Ser. No. 600,870

Claims priority, application Germany, Aug. 12, 1974, 2438725

Int. Cl.² C07D *241/04*

U.S. Cl. 424—250 **43 Claims**

1. A piperazine compound of the formula



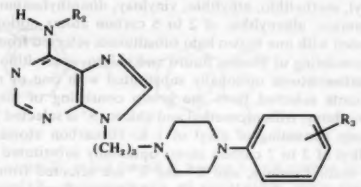
and salts thereof with a physiologically tolerable acid, wherein R_1 is diphenylmethyl, in the phenyl groups of which the para-hydrogen may be replaced by chlorine; R_2 is hydrogen, straight chain alkyl having 1 – 5 carbon atoms, alkenyl having 3 to 4 carbon atoms, or hydroxyalkyl having 2 – 4 carbon atoms; and R_3 and R_4, which are the same or different, are alkyl having 1 – 4 carbon atoms.

3,996,361
N^6-SUBSTITUTED-9-[3-(4-PHENYL-PIPERAZINO)-PROPYL]-ADENINES

Walter-Gunar Friebe, Darmstadt; Max Thiel, Mannheim; Werner Winter, Viernheim; Androniki Roesch, Mannheim, and Wolfgang Schaumann, Heidelberg, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Dec. 10, 1974, Ser. No. 531,420
Claims priority, application Germany, Jan. 11, 1974, 2401254
Int. Cl.² C07D *473/34*
U.S. Cl. 424—253 9 Claims

1. A N^6-substituted-9-[3-(4-phenyl-piperazino)-propyl]-adenine compound of the formula



(I)

wherein

R_2 is lower alkyl, lower alkyl substituted by at least one of phenyl and hydroxyl, lower alkenyl, cycloalkyl of 3 to 6 carbon atoms and phenyl, and

R_3 is hydrogen, halogen, lower alkyl or lower alkoxy,

or a salt thereof with a pharmacologically compatible acid.

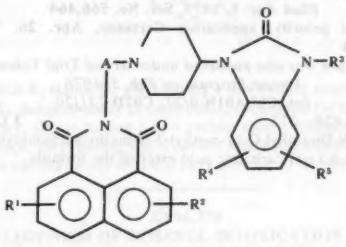
8. A method of combating edemas and related afflictions in a mammal which comprises administering to said mammal on anti-edematous effective amount of a compound according to claim 1 or a salt thereof with a pharmacologically compatible carried.

3,996,362
2-[[4-(2,3-DIHYDRO-2-OXO-1H-BENZIMIDAZOL-1-YL)-1-(PIPERIDINYL OR 1,2,3,6-TETRAHYDRO-1-PYRIDINYL)]ALKYL]-1H-BENZ[de]ISOQUINOLINE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 28, 1975, Ser. No. 581,444
Int. Cl.² A61K *31/645*, *31/47*; C07D *401/14*
U.S. Cl. 424—258 24 Claims

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, nitro, amino, trifluoromethyl and cyano; R^3 is hydrogen or lower alkyl, R^4 and R^5 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogen; and A is straight or branched chain alkylene of 1 to 8 carbons; the dashed line indicates the optional presence of a double bond; and a pharmaceutically acceptable acid addition salt thereof.

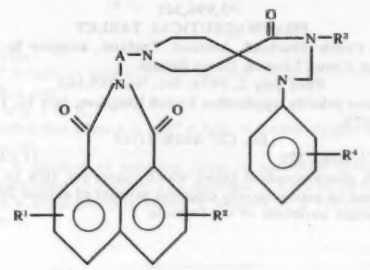
23. A composition useful for treating depression in mammals comprising as the active ingredients from about 0.5 to about 100 mg. per kg. of body weight of the mammal being treated of a compound or mixtures of compounds of claim 1 and a pharmaceutically acceptable carrier.

3,996,363
2-[4-OXO-1-PHENYL-1,3,8-TRIAZASPIRO[4.5]DECAN-8-YL)ALKYL]-1H-BENZ[DE]ISOQUINOLIN-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 13, 1975, Ser. No. 586,678
Int. Cl.² A61K *31/645*, *31/47*; C07D *471/10*, *401/06*
U.S. Cl. 424—258 13 Claims

1. A compound of the formula



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkylthio, halogen, trifluoromethyl, amino, nitro and cyano; R^3 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl; R^4 is selected from the group consisting of hydrogen, lower alkyl, and halogen, and A is a straight or branched chain alkylene of 1 to 8 carbons; and a pharmaceutically acceptable acid addition salt thereof.

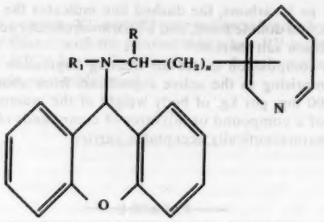
12. A composition useful for treating depression in mammals comprising as the active ingredients from about 0.5 to about 100 mg. per kg. of body weight of the mammal being treated of a compound or mixtures of compounds of claim 1 and a pharmaceutically acceptable carrier.

3,996,364
9-XANTHYLAMIN OALKYLPYRIDINE DERIVATIVES

Paul E. Bender, Willingboro, N.J.; Bernard Loev, Broomall, and Carl David Perchonock, Philadelphia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 6, 1975, Ser. No. 602,[illegible]
Int. Cl.² C07D *405/12*
U.S. Cl. 424—263 8 Claims

1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound in which:

R is hydrogen or lower alkyl of from 1 to 3 carbon atoms;

R_1 is hydrogen or lower alkyl of from 1 to 3 carbon atoms;

n is from 0 to 3.

8. A method of inhibiting gastric acid secretion which comprises administering internally to animals a chemical compound as defined in claim 1 in an amount sufficient to produce said inhibition.

3,996,365

PHARMACEUTICAL TABLET

David Cedric Sharland, Ashtead, England, assignor to Beecham Group Limited, Great Britain

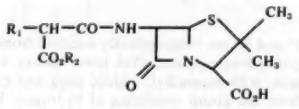
Filed July 2, 1974, Ser. No. 485,163

Claims priority, application United Kingdom, July 12, 1973, 33214/73

Int. Cl.² A61K *31/43*

U.S. Cl. 424—271 **11 Claims**

1. A pharmaceutical tablet which comprises 10% to 70% urea and an antibacterially effective amount of at least 20% of a β-lactam antibiotic of the formula



wherein

R_1 is phenyl or thienyl; and

R_2 is phenyl, tolyl or indanyl; or a pharmaceutically acceptable salt thereof.

3,996,366

THIO DERIVATIVES OF IMIDAZOL-1-YL CARBOXAMIDES

Maurice W. Baker; John C. Kerry; Antonin Kozlik; John R. Marshall; Kenneth J. Nichol, and David M. Weighton, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

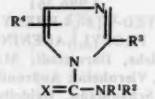
Continuation-in-part of Ser. No. 417,991, Nov. 21, 1973, Pat. No. 3,940,484, which is a continuation-in-part of Ser. No. 311,009, Nov. 30, 1972, Pat. No. 3,868,458. This application Nov. 14, 1974, Ser. No. 523,774

Claims priority, application United Kingdom, Nov. 19, 1973, 53621/73

Int. Cl.² C07D *233/84*

U.S. Cl. 424—273 **21 Claims**

1. A compound of the formula



in which X is selected from the group consisting of oxygen and sulphur, R^3 is selected from the group consisting of alkylthio of 1 to 6 carbon atoms optionally substituted with at least one substituent selected from the group consisting of chloro, bromo, fluoro, methoxy, ethoxy, methoxy carbonyl, ethoxy carbonyl, methylthio, ethylthio, vinyloxy, dimethylamino and diethylamino, alkenylthio of 2 to 6 carbon atoms optionally substituted with one to two halo substituents selected from the group consisting of bromo, fluoro and chloro, aralkylthio of 7 to 8 carbon atoms optionally substituted with one or more substituents selected from the group consisting of methyl, nitro, methoxy, trifluoromethyl and chloro; R^4 is selected from the group consisting of alkyl of 1 to 10 carbon atoms and cycloalkyl of 3 to 7 carbon atoms optionally substituted with 1 to 3 methyl groups; and R^1 and R^2 are selected from the group consisting of (a) lower alkyl and lower alkenyl, and (b) R^1 is lower alkyl and R^2 is selected from the group consisting of alkoxy alkyl of 3 to 6 carbon atoms and lower halo alkyl; and salts thereof of acids selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, hydrofluoric, sulphuric, nitric, phosphoric, perchloric, sulphamic, formic, acetic, trichloroacetic, oxalic, picric, benzenesulphonic, dodecylbenzenesulphonic, p-toluenesulphonic, stearic, flavianic, embonic or tetraiodophthalaic acids.

3,996,367

N,N-DIMETHYL-O-[1-METHYL-3-N-METHYLCARBAMINYL-METHYL-PYRAZOL(5)YL]-CARBAMIC ACID ESTER

Hellmut Hoffmann, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 9, 1975, Ser. No. 566,464

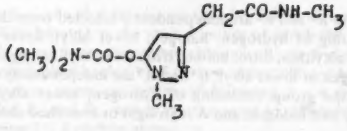
Claims priority, application Germany, Apr. 26, 1974, 2420360

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² A01N *9/22*; **C07D** *231/20*

U.S. Cl. 424—273 **3 Claims**

1. N,N-Dimethyl-O-[1-methyl-3-N-methylcarbaminylmethyl-pyrazol(5)yl]-carbamic acid ester of the formula



3,996,368

ANTHELMINTICALLY ACTIVE 2-CARBALKOXYAMINO-5(6)-PHENYL SULFONYLOXY BENZIMIDAZOLES

Heinz Loewe, Kelkheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Dieter Düwel, Hofheim, Taunus, and Reinhard Kirsch, Niederjosbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

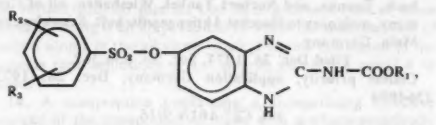
Filed Aug. 26, 1975, Ser. No. 607,928

Claims priority, application Germany, Aug. 24, 1974, 2441201

Int. Cl.² C07D 235/32

U.S. Cl. 424—273 5 Claims

1. A 2-carbalkoxyamino-5(6) phenylsulfonyloxy benzimidazole of the formula



in which R_1 stand for alkyl having 1 to 4 carbon atoms, R_2 and R_3, independently of each other, each stands for hydrogen, hydroxy, alkoxy having 1 to 4 carbon atoms, halogen, trifluoromethyl, alkyl having 1 to 4 carbon atoms, carbalkoxy having 1 to 4 carbon atoms in the alkoxy moiety, or cyano.

3,996,369

ANTHELMINTICALLY ACTIVE 2-CARBALKOXYAMINO BENZIMIDAZOLYL-5(6)-SULFONIC ACID PHENYL ESTERS

Heinz Loewe, Kelkheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Dieter Duwel, Hofheim, Taunus, and Reinhard Kirsch, Niederjosbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

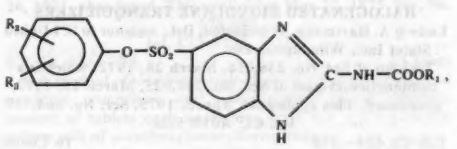
Filed Aug. 26, 1975, Ser. No. 608,014

Claims priority, application Germany, Aug. 28, 1974, 2441202

Int. Cl.² C07D 235/32

U.S. Cl. 424—273 11 Claims

1. A 2-carbalkoxyamino benzimidazolyl-5(6) sulfonic acid phenyl ester of the formula



in which R_1 stands for alkyl having 1 to 4 carbon atoms, R_2 and and R_3, independently of each other, each stand for hydrogen, hydroxy, alkoxy having 1 to 4 carbon atoms, halogen, trifluoromethyl, alkyl having 1 to 4 carbon atoms, carbalkoxy having 1 to 4 carbon atoms in the alkoxy moiety, or cyano.

3,996,370

ANTAGONISM OF ETHANOL INTOXICATION WITH 4[(4,5-DIHYDRO-2-1H-IMIDAZOLYL)METHOXY]-N,N,2-TRIMETHYLBENZENAMINE

Abdulmunien H. Abdallah, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 16, 1975, Ser. No. 622,920

Int. Cl.² A61K 31/415

U.S. Cl. 424—273 4 Claims

1. A method useful for combatting ethanol intoxication and narcosis in a mammal comprising administering orally or by injection to said mammal a dose of from 1 to 120 milligrams per kilogram of body weight of a benzenamine compound selected from the group of 4((4,5-dihydro-2-1H-imidazolyl)-methoxy)-N,N,2-trimethylbenzenamine and the pharmaceutically-acceptable salts thereof.

3,996,371

OPTIONALLY SUBSTITUTED 3-METHYLSULFINYL INDAZOLES

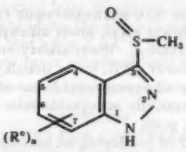
Thomas E. Jackson, Madison, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Nov. 17, 1975, Ser. No. 632,185

Int. Cl.² A61K 31/415; C07D 231/56

U.S. Cl. 424—273 9 Claims

1. A compound of the formula:



wherein

R° is halo of atomic weight of from 18 to 80 or trifluoromethyl, and

n is 0, 1 or 2,

provided that when *n* is 2, R° is halo of atomic weight of from 18 to 80.

7. A method of inducing sleep in mammals comprising administering at bedtime to a mammal in need of such treatment a sleep-inducing effective amount of a compound of claim 1.

3,996,372

INSECTICIDAL 1-ACYL-3-SUBSTITUTED-2-(NITRO(PHENYLTHIO)-METHYLENE)IMIDAZOLIDINES

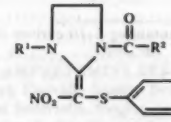
Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 3, 1975, Ser. No. 637,251

Int. Cl.² C07D 233/20

U.S. Cl. 424—273 3 Claims

1. A compound of the formula:



wherein *n* is zero, 1 or 2, R is halogen, nitro or alkyl, or alkoxy each of from one to six carbon atoms, R^1 is alkyl, alkenyl, haloalkenyl, alkynyl or cyanoalkyl each of up to ten carbon atoms and R^2 is alkyl of from one to ten carbon atoms or is phenyl, or phenalkyl in which the alkyl moiety contains from one to four carbon atoms, or either of these substituted on the ring by from one to two of one or more of halogen, nitro or alkyl or alkoxy each of from one to six carbon atoms.

3,996,373
2,3-DIHYDRO-1H-DIBENZ[e,g]ISOINDOLE COMPOUNDS

Hans Blattner, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

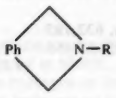
Filed Mar. 27, 1975, Ser. No. 562,602

Claims priority, application Switzerland, Apr. 5, 1974, 4846/74

Int. Cl.² C07D *209/44;* **A61K** *31/40*

U.S. Cl. 424—274 **19 Claims**

1. A 2,3-Dihydro-1H-dibenz[e,g]isoindole derivative selected from a compound of the formula I



(I)

wherein

Ph represents the 9,10-phenanthrylene radical, and

R represents a lower alkyl, lower alkenyl, lower haloalkyl, lower hydroxyalkyl, lower-alkoxy-lower-alkyl, lower-alkanoyloxy-lower alkyl, lower oxoalkyl, lower carboxy-alkyl or lower-alkoxycarbonyl-lower-alkyl group

and the pharmaceutically acceptable salts thereof with inorganic and organic acids.

19. The method of producing an antidepressive effect in a warm-blooded animal which comprises administering to said warm-blooded animal an antidepressive effective amount of a compound of the formula I according to claim 1 or one of its pharmaceutically acceptable salts.

3,996,374
ISOINDOLE DERIVATIVES AS APPETITE SUPPRESSANTS

Roland Jaunin, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

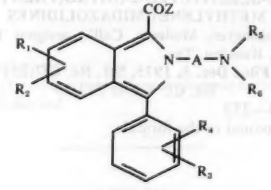
Filed Nov. 20, 1975, Ser. No. 633,514

Claims priority, application Switzerland, Nov. 28, 1974, 15795/74; Sept. 23, 1975, 12342/75

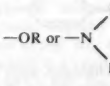
Int. Cl.² C07D *209/44;* **A61K** *31/40*

U.S. Cl. 424—274 **38 Claims**

38. A composition comprising a compound of the formula



wherein A is alkylene containing 2–10 carbon atoms, Z is the group



R is alkyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl, allyl or aralkyl, R_1, R_2, R_3 and R_4, independently, are hydrogen, halogen, alkyl, alkoxy or trifluoromethyl, and R_5 and R_6, independently, are hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, alkoxyalkyl, aryl or aralkyl, or R_5 and R_6, taken together, are the group $-(CH_2)_n-$, wherein n is an integer of 2–7, or R_5 and R_6, taken together with the nitrogen atom to which they are attached, are a 5-membered or 6-membered heterocyclic ring containing an oxygen atom or an additional nitrogen atom which may be substituted by alkyl or hydroxyalkyl, and R_7 and R_8, independently, are hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl or aralkyl, provided that at least one of R_7 and R_8 is other than hydrogen, or a pharmaceutically acceptable acid addition salt thereof, and a compatible pharmaceutical carrier material.

3,996,375
INSECTICIDAL COMPOSITION FOR ULTRA LOW VOLUME APPLICATION

Heinz Frensch, Frankfurt am Main; Konrad Albrecht, Fischbach, Taunus, and Norbert Taubel, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 26, 1974, Ser. No. 536,362

Claims priority, application Germany, Dec. 28, 1973, 2364894

Int. Cl.² A01N *9/16*

U.S. Cl. 424—276 **6 Claims**

1. Insecticidal compositions for ultra low volume (ULV) application which comprises

a. from 15 to 35 weight percent of 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepine-3-oxide;

b. from 60 to 84.5 weight percent of a solvent mixture consisting of 15 to 85 weight percent of a liquid ester formed from a monoalcohol of 1 to 12 carbon atoms and a monovalent or bivalent carboxylic acid of 2 to 10 carbon atoms, said ester containing at least 8 and a maximum of 12 carbon atoms in the case of an ester of a monovalent acid and at least 8 and a maximum of 32 carbon atoms in the case of esters of a bivalent acid and from 15 to 85 weight percent of an aromatic hydrocarbon consisting essentially of an alkyl substituted benzene of 9 to 11 carbon atoms or a 1- or 2-methyl substituted naphthalene having a boiling range of from 168° to 250° C; and

c. from 0.5 to 5 weight percent of an epoxide selected from the group consisting of epichlorohydrin, epoxypropane, styrene oxide, phenyl epoxy-propane, and an epoxide of an unsaturated vegetable oil.

3,996,376
HALOGENATED DIOXOLANE TRANQUILIZERS

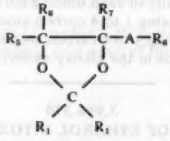
Ludwig A. Hartmann, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 238,956, March 28, 1972, which is a continuation-in-part of Ser. No. 235,025, March 15, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,745

Int. Cl.² A01N *9/28*

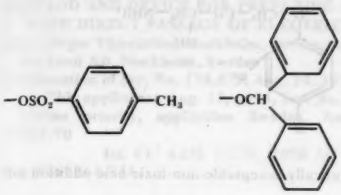
U.S. Cl. 424—278 **16 Claims**

1. A compound of the formula



wherein each R_1 is an independently selected perhalogenated alkyl radical, A is an alkylene radical, R_6 is selected from the group consisting of

$-ONO_2$ $-OCH_2C{\equiv}CH$



R_5 is selected from the group consisting of hydrogen, alkyl and —A—R_6, and R_7 and R_8 are independently selected from the group consisting of hydrogen and lower alkyl radicals and with the further proviso that R_6 can be a hydroxyl radical when either R_7 or R_8 is an alkyl radical or when the total number of carbon atoms in the alkylene or alkyl chains contained in the radicals represented by —A— and R_5 combined equal 6 or more.

14. A composition containing a tranquilizing effective amount of the compound of claim 1 in a pharmaceutically acceptable carrier.

16. A method of tranquilizing a mammal comprising administering a tranquilizing effective amount of a composition of claim 14.

3,996,377

MEDICINAL PREPARATION FOR TREATING PARODONTOSIS AND METHOD OF TREATING PARODONTOSIS

Alexander Nikolaevich Nesmeyanov, Glavnoe zdanie MGU, korpus "K", kv. 105, Moscow; Ljubov Grigorievna Bogomolova, ulitsa Nekrasova, 60, kv. 131, Leningrad; Nadezhda Sergeevna Kochetkova, ulitsa Garibaldi, 23/56, korpus 4, kv. 27, Moscow; Vera Dmitrievna Vilchevskaya, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 47, Moscow; Nikanor Petrovich Palitsyn, ulitsa Stankevicha, 12, kv. 10, Moscow; Julia Julievna Gorelikova, Nagatinskaya ulitsa, 58, korpus 2, kv. 3, Moscow; Irina Gennadievna Andrianova, prospekt Smirnova, 43, kv. 27, Leningrad; Olga Petrovna Belozerova, prospekt Mira, 124, korpus 15, kv. 72, and Vera Khusainovna Sjundjukova, ulitsa Vavilova, 44/2, kv. 154, both of Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 423,533, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 119,356, Feb. 26, 1971, abandoned. This application May 22, 1975, Ser. No. 579,804

Int. Cl.² A61K *31/295*

U.S. Cl. 424—295 **2 Claims**

1. A method of treating parodontosis in a human having said condition comprising oral administration of an effective amount of tablets each containing from 0.1 – 0.3 g of the sodium salt of o-carboxybenzoylferrocene.

3,996,378

WATER-BASED MICROBICIDE FORMULATION

James H. Payton, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 517,675, Oct. 24, 1974, abandoned. This application July 30, 1975, Ser. No. 600,746

Int. Cl.² A01N *9/18*

U.S. Cl. 424—302 **4 Claims**

1. In a water-based microbicide composition comprising methylene bis thiocyanate and a xanthan gel carrier, the improvement comprising utilizing a dispersion of methylene bis thiocyanate with a particle size of 0.8–150 microns in a xanthan gel carrier wherein the methylene bis thiocyanate is about 5–20% of the xanthan gel and wherein said formulation possesses superior safety attributes of less toxicity and less flammability over organic solvent based compositions.

3,996,379

MITICIDAL COMPOUNDS

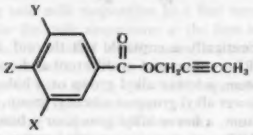
Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 217,702, Jan. 3, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 526,862

Int. Cl.² A01N *9/20, 9/24*

U.S. Cl. 424—308 **1 Claim**

1. A method of killing mites comprising applying to the mites or to a locus to be protected a miticidally effective amount of a compound having the formula:



wherein X is selected from the group consisting of H, Br, Cl, and NO_2; Y is selected from the group consisting of H and NO_2; and Z is selected from the group consisting of H and Cl, with the provision that when Z is Cl, Y is H and X is Cl, and the X, Y, and Z are never simultaneously H.

3,996,380

ALKYNYL ESTERS FOR CONTROLLING MITES

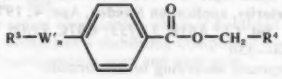
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 535,611, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 355,846, April 30, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,537

Int. Cl.² A01N *9/24*

U.S. Cl. 424—308 **7 Claims**

1. A method for controlling mites of the family Tetranychidae or the family Tarsonemidae which comprises contacting the mite eggs or larvae with an ovicidally or larvacidally effective amount of a compound of the formula:



wherein,

R^4 is lower alkynyl or lower chloroalkynyl;

R^5 is lower alkynyl or lower chloroalkynyl;

W′ is —O— or

and *n* is one.

3,996,381

AMPHETAMINE DERIVATIVES

Gösta Lennart Florvall; Svante Bertil Ross, and Sven-Ove Ögren, all of Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

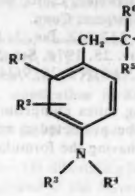
Filed Aug. 14, 1974, Ser. No. 497,295

Claims priority, application Sweden, Sept. 4, 1973, 7312002

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **12 Claims**

1. A pharmaceutical preparation which comprises as active ingredient a therapeutically effective amount for the treatment of depressive states or alleviating anxiety of a compound of the formula



or a pharmaceutically acceptable salt thereof, in which formula R^1 and R^2 are the same or different and each represents a hydrogen atom, a lower alkyl group or a halogen atom, R^3 represents a lower alkyl group or a benzyl group, R^4 represents a hydrogen atom, a lower alkyl group, or a benzyl group, R^5 represents a hydrogen atom or a methyl group, and R^6 represents a lower alkyl group, provided that R^1 and/or R^2 represents a lower alkyl group or a halogen atom when R^3 represents a methyl group, R^4 represents a methyl group and R^5 represents a hydrogen atom, in association with a pharmaceutically acceptable carrier.

3,996,382

PHENOXY-HYDROXYPROPYLAMINES, THEIR PREPARATION, AND METHOD AND PHARMACEUTICAL PREPARATIONS FOR TREATING CARDIOVASCULAR DISEASES

Peder Bernhard Berntsson, Vastra Frolunda; Arne Elof Brändström, Goteborg; Enar Ingemar Carlsson, Kungsbacka; Stig Åke Ingemar Carlsson, Molnlycke; Lars Ek, Onsala; Benny Roger Samuelsson, Pixbo; Sven Erik Sjastrand, Kungsbacka; Gert Christer Strandlund, Molndal, and Bengt Arne Hjalmar Ablad, Goteborg, all of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

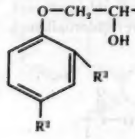
Filed Apr. 4, 1973, Ser. No. 347,625

Claims priority, application Sweden, Apr. 4, 1972, 4321/72

Int. Cl.² A61K *31/135*; C07C *93/06*

U.S. Cl. 424—330 **12 Claims**

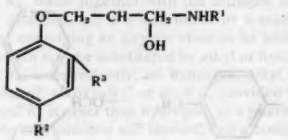
1. A compound according to the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof,

wherein R^1 is an alkyl or hydroxyalkyl radical of 1 to 4 carbon atoms; R^2 is alkoxyalkoxy of 1 to 4 carbon atoms in each alkyl part, wherein the alkyl parts may be the same or different; and R^3 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl and alkinyl of 2 to 4 carbon atoms, alkoxymethyl of 2 to 4 carbon atoms; and alkoxy of 1 to 4 carbon atoms.

9. A method providing for cardioselective antagonism to adrenergic β-receptor stimulation in an animal which comprises administering an amount effective to provide said cardioselective antagonism to adrenergic β-receptor stimulation of an ortho-para-substituted phenoxy-hydroxypropylamine compound of the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof,

wherein R^1 is an alkyl or hydroxyalkyl radical of 1 to 4 carbon atoms; R^2 is alkoxyalkoxy of 1 to 4 carbon atoms in each alkyl part, wherein the alkyl parts may be the same or different; and R^3 is selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkenyl and alkinyl of 2 to 4 carbon atoms, alkoxymethyl of 2 to 4 carbonatoms, and alkoxy of 1 to 4 carbon atoms.

3,996,383

3-ALKYLAMINO-α-AMINOMETHYL-4-HYDROXYBENZYL ALCOHOLS WITH β-ADRENERGIC STIMULANT ACTIVITY

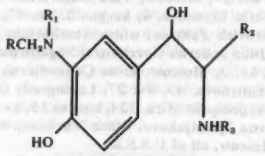
Donald F. Colella, Philadelphia, Pa., and Carl Kaiser, Haddon Heights, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 308,867, Nov. 22, 1972, Pat. No. 3,943,173. This application Nov. 12, 1975, Ser. No. 631,011

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **6 Claims**

1. A pharmaceutical composition having β-adrenergic stimulant activity comprising a pharmaceutical carrier and an amount sufficient to produce β-adrenergic stimulant activity of a compound of the formula



wherein

R and R_1 are each hydrogen or C_1–C_4 alkyl;

R_2 is hydrogen, methyl, or ethyl; and

R_3 is isopropyl, t-butyl, cyclobutyl, 1-(p-hydroxybenzyl-)ethyl, or 2-(p-hydroxybenzyl)isopropyl

or a pharmaceutically acceptable salt thereof.

3,996,384

CEREAL FLAKES PRODUCT AND PROCESS

Stanley H. Reesman, and Norman F. Lawrence, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 28, 1975, Ser. No. 581,469

Int. Cl.² A23L *1/10*, *1/164*

U.S. Cl. 426—96 **8 Claims**

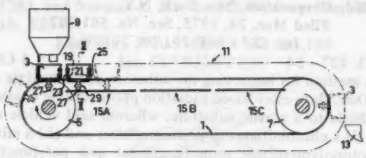
1. Process for making a toasted triticale ready-to-eat flake comprising soaking triticale grain in an aqueous solution to increase its moisture content, bumping the soaked grain to flatten and compress the grain to the extent it does not lose its structural integrity per se but is flattened to open the grain by cracking the husk portion thereof, cooking the bumped grain to gelatinize the starch content thereof and increase its moisture content to 55%, partially drying the cooked grain to less than 20% moisture, flaking the partially dried grain and toasting it.

3,996,385

METHOD AND DEVICE FOR PREPARING FOODSTUFFS WITH DIRECT PASSAGE OF ELECTRIC CURRENT

Knut Birger Vigerström, Stockholm, Sweden, assignor to Electro-Food AB, Stockholm, Sweden

Continuation of Ser. No. 174,475, Aug. 24, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,859
Claims priority, application Sweden, Aug. 24, 1970, 11461/70
Int. Cl.² A23L *1/216*; H05B *3/14*
U.S. Cl. 426—244 12 Claims



1. In a method for heating potatoes, including immersing electrodes in an electrolyte, immersing said potatoes in the electrolyte between, but substantially out of contact with said electrodes, and applying an alternating electrical potential to said electrodes to supply an alternating electric current to said electrodes so that current passes through the electrolyte and said potatoes the improvement comprising lowering, during the processing period and for the entire substance, the rate at which the electrical energy is supplied by the current by irreversibly decreasing from a first to a second potential level both greater than zero, the potential of the applied alternating current.

3,996,386

METHOD FOR PREVENTING MICROBIAL SURFACE DETERIORATION OF FOODS AND FEEDS

Yrjo Malkki, Lounaisvayla 19, Helsinki 20, and Olavi Elis Nikkila, Perustie 13 A 12, Helsinki 33, both of Finland

Continuation-in-part of Ser. No. 315,186, Dec. 14, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,715
Claims priority, application Finland, Dec. 15, 1971, 3568/71
Int. Cl.² A21D *15/08*; A23C *3/08*; A23L *3/34*
U.S. Cl. 426—321 10 Claims

1. In a method for preventing microbial surface deterioration of food and feeds by applying to the surface an antimicrobial preservative substance the improvement comprising applying said preservative substance in the form of an aerosol in which a substantial fraction of the particles in the aerosol have a diameter less than 5 microns.

3,996,387

FLAVORING WITH 3,7-DIMETHYL-OCTA-2,6-DIENYL-MERCAPTAN

Daniel Helmlinger, Dubendorf; Dietmar Lamparsky, Wangen-Dubendorf; Peter Schudel, Grut; Jost Wild, Zurich, and Trudi Sigg-Grutter, Winterthur, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 251,060, May 8, 1972, Pat. No. 3,896,175. This application Dec. 20, 1974, Ser. No. 534,930
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.² A23L *1/226*
U.S. Cl. 426—535 3 Claims

1. Process for flavoring foodstuffs and delicacies or drinks characterized in that 3,7-dimethyl-octa-2,6-mercaptan is incorporated therein in an amount from 10 ppb to 100 ppm of said compositions.

3,996,388

PROCESS OF MAKING A WAFFLE BATTER

William R. Bellamy, 2775 Duke of Gloucester Drive, and Robert H. Brooks, 3073 Duke of Gloucester Drive, both of East Point, Ga. 30344

Filed Aug. 13, 1975, Ser. No. 604,439
Int. Cl.² A21D *10/04*
U.S. Cl. 426—552 4 Claims

1. A process for preparing a waffle batter comprising the steps:

a. Forming a milk suspension of water, a stabilizer and skim milk powder;
b. Bringing said milk suspension to a first temperature;
c. Adding to the milk suspension at the first temperature a vegetable fat material having a melting point below said first temperature to form a base mix;
d. Heating said base mix to a second temperature of at least 160° F to cook said base mix;
e. Homogenizing said cooked base mix;
f. Rapidly cooling said base mix to below 40° F to form the base;
g. Mixing with said base the ingredients: (1) baking powder; (2) eggs fluffed to greater than their original volume; (3) salt and sugar and (4) shortening to form a last mix, said mixing occurring at a temperature between 36° F and 40° F;
h. Blending flour into said last mix to form the batter; said base containing by weight percentage 74–78% water, 0.3–0.5% stabilizer, 9.7–10.8% skim milk powder and 11.9–14.1% vegetable fat material; said batter containing by weight percentage 52–55% base, 1.3–1.7% baking powder, 5.7–6.6% eggs fluffed to at least 200% of their original volume, 0.30–0.64% salt, 5.5–6.8% sugar, 5.5–6.8% shortening, and 25–27% flour; and said batter being 48–50% solids and 50–52% liquids.

3,996,389

STABILIZER BLEND

John Thomas Osborne, Wayzata, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Feb. 25, 1976, Ser. No. 661,197
Int. Cl.² A23G *9/00*
U.S. Cl. 426—565 5 Claims

1. An ice cream composition which is stabilized and uncurdled which comprises a stabilizing component consisting essentially of xanthomonas gum and guar gum.

3,996,390

ACIDIFIED MILK GEL AND METHOD OF PRODUCING THE SAME

Robert S. Igoe, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 8, 1975, Ser. No. 620,739
Int. Cl.² A23L *1/04*; A23C *23/00*
U.S. Cl. 426—573 7 Claims

1. A gelling system for the preparation of an acidified milk gel upon heating consisting essentially of an acid food juice comprising in parts by weight from about 7% to about 22% of carboxymethyl cellulose and from about 78% to about 93% gelatin having an isoelectric point of from about pH 4.7 to about pH 5.1, the percentages based on the total weight of the thickener composition.

3,996,391

METHOD FOR PRODUCTION OF SYRUP FOR SOFT DRINK

Kaoru Inagami, Tokyo, and Mizuho Tanaka, Tachikawa, both of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1974, Ser. No. 533,649
Int. Cl.² A23L *2/00*; A23C *23/00*
U.S. Cl. 426—590 5 Claims

1. A syrup comprising, as its basal ingredients,

a. cow's milk in an amount to give a milk-solids-not-fat content of from 3.0 to 5.0 w/w% in the syrup,
b. sugar (the sum of sugar of the cow's milk and a supplementarily added sugar) in an amount to give a sugar content of at least 3 times the weight of said milk-solids-not-fat content in the syrup, and
c. an edible acid to give the syrup a pH value of from 3.0 to 3.4.

3,996,392

HUMIDITY-INSENSITIVE FERRITE DEVELOPER MATERIALS

Allan C. Berg, Rochester; John W. Fitzpatrick, Fairport, and Lewis O. Jones, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,906
Int. Cl.² G03G *13/09*, *9/14*; H01F *1/37*
U.S. Cl. 427—19 14 Claims

14. An electrostatographic imaging process comprising the steps of forming an electrostatic latent image on a surface and developing said electrostatic latent image by contacting said electrostatic latent image with a developer mixture comprising finely-divided toner particles electrostatically clinging to the surfaces of carrier particles, said carrier particles comprising humidity-insensitive ferrite beads having an average particle diameter from between about 30 to about 1,000 microns, said carrier particles having been prepared by blending an essentially stoichiometric mixture of ferrite forming metal oxides, calcining the blended oxides in air at a temperature of up to about 2150° F. for up to about 30 minutes to provide said blended oxides with a saturation magnetic moment of between about 6 to about 30 electromagnetic units per gram, milling the calcined oxides in a slurry to reduce the particle size of said calcined oxides to between about 0.8 microns and about 1.6 microns, adding to said slurry from about 0.02 to about 0.08 mole fraction of manganese oxide and about 0.001 to about 0.100 mole fraction of copper oxide based on all divalent metal oxides, adding a sodium-free deflocculant to said slurry in an amount of from about 0.5 to about 2.0 percent by weight based on the weight of said metal oxides, adding water to said slurry to provide a slurry having about 80.0 percent by weight of solids, pumping said slurry to hold/feed tanks with continuous mixing while adding a binder material to said slurry in an amount of from about 0.2 to about 1.5 percent by weight based on the weight of said metal oxides, spray-drying said slurry to form substantially spherical beads, screening said beads to obtain particles having a controlled size, firing said particles in air at a temperature of up to about 2500° F. for about 4 to about 8 hours to provide them with a saturation magnetic moment of about 48 electromagnetic units per gram, deagglomerating said particles, and screening said particles to obtain ferrite particles characterized as having surface sodium in an amount of less than about 20 parts per million, surface zinc in an amount of less than about 5,000 parts per million, and a BET surface area of between about 170 cm²/gram and about 500 cm²/gram, whereby at least a portion of said finely-divided toner particles are attracted to and held on said surface in conformance to said electrostatic latent image.

3,996,393

POSITIVE POLYMERIC ELECTRON BEAM RESISTS OF VERY GREAT SENSITIVITY

Charles A. Cortellino, Wappingers Falls, N.Y.; Edward Gipstein; William A. Hewett, both of Saratoga, Calif.; Duane E. Johnson, Los Gatos, Calif., and Wayne M. Moreau, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,058
Int. Cl.² B05D *3/06*
U.S. Cl. 427—43 6 Claims

1. In a process for preparing a positive acting polymeric electron beam resist the improvement according to which the number average molecular weight of the starting polymeric resist material is at least one million and the radiation exposure is a dosage less than about 3×10^{-6} coulombs per cm², and the polymeric resist material is selected from the group consisting of poly (methyl methacrylate), poly (t-butyl methacrylate), poly (alpha-methyl-styrene) and poly (methacrylonitrile).

3,996,394

METHOD OF IMPROVING ADHESION TO PLASTIC SUBSTRATES

Edward Bruce Harris, Spring Valley, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,307
Int. Cl.² C08F *291/04*, *291/06*
U.S. Cl. 427—54 4 Claims

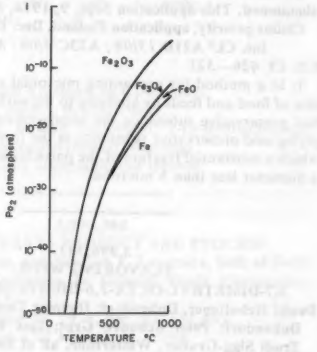
1. A method for improving the adhesion of an acrylate ester or methacrylate ester based radiation photocurable coating or ink vehicle to a plastic substrate, wherein said vehicle comprises (i) a photoinitiator or photosensitizer and (ii) a mixture of photopolymerizable monofunctional and polyfunctional acrylate or methacrylate esters; said method comprising adding to said vehicle from 10 to 50 weight percent based on the weight of the total composition of poly(vinyl acetate) or a poly(vinyl chloride/vinyl acetate) polymer having a polymerized vinyl chloride content of from about 55 to about 90 mole percent, said poly(vinyl acetate) or poly(vinyl chloride/vinyl acetate) polymer being essentially soluble in said esters mixture, applying the modified ink or coating to a plastic substrate, and exposing the applied ink or coating to ultraviolet light radiation for a period of time sufficient to cure said applied ink or coating on said plastic substrate to a dry tack-free state.

3,996,395

METHOD OF INCREASING THE COERCIVITY OF MAGNETITE FILMS

Shih-Lu Chen, and James A. Murphy, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 26, 1972, Ser. No. 257,336
Int. Cl.² H01F *10/02*
U.S. Cl. 427—129 16 Claims



1. A method of processing magnetic films comprising the steps of
providing an inorganic and non-magnetic substrate having a film of alpha ferric oxide formed on a surface thereof,
heating said film-substrate combination to a temperature of at least 400° C in a reducing atmosphere for a time sufficient to convert said film of alpha ferric oxide to magnetite, thereafter
maintaining said magnetite film at a temperature between 150° and 300° C, and

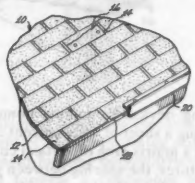
subjecting said magnetite film to an oxidizing atmosphere while maintaining said temperature thereof between 150° and 300° C for a time sufficient to partially oxidize said magnetite film and form a solid continuous film of a solid solution of magnetite and gamma ferric oxide, said solid solution being represented by the formula $(1-x)Fe_3O_4 \cdot xFe_2O_3$, where x has a value within the rang of 0.49 and 0.85.

3,996,396

METHOD FOR REPAIRING ROOFING

Howard C. Hansen, 926 E. Hermosa Drive, Tempe, Ariz. 85282, and Norman L. Marsh, 818 W. Estes Way, Phoenix, Ariz. 85041

Filed May 27, 1975, Ser. No. 581,106
Int. Cl.² B32B 35/00
U.S. Cl. 427—140 4 Claims



1. A method of repairing a roof structure comprising the steps of:

a. spreading a porous conformable membrane over the existing roofing materials;

b. shaping said porous conformable membrane by moistening thereof with a liquid to provide a contiguous conformity thereof with the surface of the existing roofing materials;

c. tacking said porous conformable membrane through the existing roofing materials to the roofing substrate to mechanically affix said membrane and the existing roofing materials thereto;

d. applying a penetrating sealing adhesive to said porous conformable membrane to form a sealed bonded laminate of said membrane and the existing roofing materials; and

e. applying a waterproof coating substance on said porous conformable membrane.

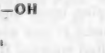
3,996,397

THERMOGRAPHIC RECORDING PROCESS

Urbain Leopold Laridon, Wilrijk; Albert Lucien Poot, Kontich, and Jozef Frans Willems, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 3, 1974, Ser. No. 457,547
Claims priority, application United Kingdom, Apr. 4, 1973, 16166/73; June 19, 1973, 29073/73
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² B41M 5/12, 5/18
U.S. Cl. 427—145 11 Claims

1. A recording process, which comprises exposing to a heat pattern a support carrying an organic reducing compound corresponding to one of the following general formulae:

 (I)

wherein:

R_1 represents hydrogen, an aliphatic group containing up to about four carbon atoms; and R_2 represents an alkoxy group containing up to 18 carbon atoms, an aryloxy group, an amino group of the formula

in which R_3 and R_4 (same or different) represent hydrogen, an aliphatic group or an aromatic group, or R_3 and R_4 represent together the necessary atoms to close a 5- or 6-membered heterocyclic nitrogen containing nucleus; and

 (II)

wherein:

R_5 represents an aliphatic group containing up to 18 carbon atoms, an aromatic group or a 5- or 6-membered heterocyclic group; and a reducible noble metal salt of an aliphatic carboxylic acid, said organic reducing compound being present in an effective amount to reduce said noble metal salt and said heat pattern having a temperature of at least about 60°C and sufficient to initiate said reduction.

3,996,398

METHOD OF SPRAY-COATING WITH METAL ALLOYS

Pierre Manfredi, Orange, France, assignor to Societe de Fabrication d'Elements Catalytiques, St. Pierre de Senos, France

Continuation of Ser. No. 411,259, Oct. 31, 1973, abandoned. This application July 25, 1975, Ser. No. 598,767
Claims priority, application France, Nov. 8, 1972, 72.39603
Int. Cl.² B05D 3/02, 1/08
U.S. Cl. 427—191 6 Claims

1. A method of improving the adherence of a metal coating on an aluminum substrate metallized by spraying a metal coating onto a metal substrate of aluminum or an aluminum base alloy, the steps of sand blasting the metal substrate, heating said substrate, spraying a hard-metal powder fusing above 1000° C of nickel or cobalt alloys on the substrate, the spraying operation carried out at a distance of 50 to 200 mm from the metallizing device, boron and silicon reducing agents for lowering the melting point being present in the metal powder, the metal substrate being heated to a temperature between 390° and 650° C and the spraying of the metal powder being carried out at a velocity within the range of 100 to 250 m/sec. causing an exothermic reaction with the formation of a high melting point intermediate layer between the coating and the substrate.

3,996,399

PROCESS FOR IMPROVING THE STABILITY AND SHAPING OF ANHYDROUS SODIUM METASILICATE, AND THE PRODUCTS, AND COMPOSITIONS CONTAINING SAME

Georges Vrisakis, Collonges-Au-Mon-D'Or, France, assignor to Societe Francaise des Silicates Speciaux "SIFRANCE", Courbevoie, France

Filed June 9, 1975, Ser. No. 584,754
Claims priority, application France, June 10, 1974, 74.19932
Int. Cl.² C11D 3/08
U.S. Cl. 427—215 7 Claims

1. A process for improving the stability and minimizing agglomeration and disintegration of sodium metasilicate particles consisting essentially of providing a sodium metasilicate having less than 10% by weight water, treating the sodium metasilcate particles with a monosodium phosphate by mixing the the sodium metasilicate particles with monosodium phosphate in powder form or by coating the sodium metasilicate particles with an aqueous solution of monosodium phosphate, in the ratio of 20–60 parts by weight sodium metasilicate to 0.2 to 2 parts by weight monosodium phosphate.

4. A process according to claim 1 which includes mixing a non-ionic surface active agent with the treated sodium metasilicate wherein the non-ionic surface active agent is present in an amount within the range of 1-5% by weight.

3,996,400

METHOD FOR SURFACE COATING FERROUS ALLOY PARTS

Jacques-Jean Caubet, Andrezieux-Boutheon, France, assignor to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, Andrezieux-Boutheon, France

Filed Dec. 12, 1974, Ser. No. 532,105

Claims priority, application France, Apr. 25, 1973, 73.15787

Int. Cl.² C23C *13/02*

U.S. Cl. 427—253 1 Claim

1. A method for coating a ferrous alloy member with a layer consisting essentially of $FeSn_2$, FeSn and $FeSnC_x$ phases where x ranges from 0.7 to 1.3 according to the following proportions:

$FeSn_2$ ranging from 5–30% by volume

FeSn ranging from 60–95% by volume

$FeSnC_x$ ranging from 0–10% by volume

the distribution of said three phases within the layer being in accordance with the diagrams of FIGS. 1, 2 and 3, respectively,

comprising the steps of placing the ferrous alloy member in an oven, maintaining the temperature range in said oven from 400° C to 700° C and providing a gaseous atmosphere inside said oven which is comprised of a mixture of the vapor of a tin halide and a reducing gas.

3,996,401

FLAT ROOFING LAMINATE HAVING MEANS TO ARREST TRANSMISSION OF DEFORMATIONS FROM THE BOTTOM SURFACE TO THE TOP SURFACE

Roger Van Nechel, Brussels, Belgium, assignor to Compagnie Generale des Asphaltes-Asphaltoc-S.A., Brussels, Belgium

Filed Feb. 28, 1975, Ser. No. 554,041

Claims priority, application Belgium, Mar. 5, 1974, 141652; Feb. 6, 1975, 153142

Int. Cl.² D06N *5/00*; D06M *7/14*, *11/04*; E04D *1/28*

U.S. Cl. 428—101 4 Claims

1. A flat roofing comprising:

a lower support able to be submitted in use to deformations

an upper sealant covering

a disengagement sheet made of an elastic flexible and deformable material and arranged between said lower support and said upper sealant covering

lower adhesion zones connecting said disengagement sheet with the lower adjacent element of the roofing, in particular with said lower support, said lower adhesion zones being able to undergo horizontal relative displacements dependant on the deformations of said lower support

upper adhesion zones connecting said disengagement sheet with the upper adjacent element of the roofing, in particular with said upper sealant covering, and alternating with respect to said lower adhesion zones

and a horizontally undeformable structural sheet adhesively associated with the upper adhesion zones, preventing relative horizontal movement of said upper adhesion zones and effect on said upper sealant covering by deformations of said lower support.

3,996,402

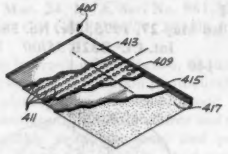
FASTENING DEVICE FOR USE WITH INDUCTION HEATER APPARATUS AND SYSTEM FOR HOLDING TOGETHER TWO NONMETAL SURFACES

Melvin R. Sindt, Stanwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 448,110, March 4, 1974, abandoned, which is a division of Ser. No. 331,724, Feb. 12, 1973, Pat. No. 3,845,268. This application Mar. 17, 1975, Ser. No. 559,341

Int. Cl.² B29C *27/08*; B32B *15/08*, *3/10*; H05B *9/02*

U.S. Cl. 428—140 2 Claims



1. A fastening device for joining nonmetallic objects together comprising a sheet of eddy current conducting metallic material having a matrix area of vertical columns and horizontal rows of apertures, the spacing between geometrical centers of said apertures along the length and width of said matrix area equal to about twice the widths of said apertures, said sheets disposed between a pair of sheets of heat activatable material for providing hot melt bonds between said nonmetallic objects via said matrix of apertures, and means for adhesively securing an exposed surface area of at least one of said pair of sheets to a nonmetallic object.

3,996,403

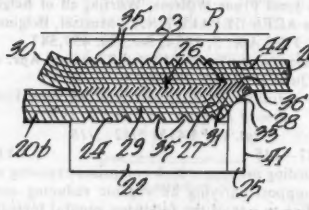
STRAPPING JOINT AND METHOD AND APPARATUS FOR FORMING SAME

Russell J. Gould, Arlington Heights, and Karl Adams, Schaumburg, both of Ill., assignors to Signode Corporation, Ohio

Filed Nov. 25, 1974, Ser. No. 526,893

Int. Cl.² B32B *7/14*

U.S. Cl. 428—198 6 Claims



1. A molecularly oriented thermoplastic strap formed into a loop having overlapping inner and outer end portions, said end portions being fused to one another by a resolidified thin layer of formerly melted material from each overlapping strap end portion, said resolidified material extending completely to the end of the outer strap end portion characterized by said outer end portion having a tapered end producing a reducing taper toward said inner end portion, said reducing taper having an outer edge that forms part of said resolidified thin layer to provide a joint having improved snag resistance.

3,996,404

CONJUGATE POLYCARBONATE FIBERS AND FIBROUS SHEETS MADE THEREOF

Kounosuke Matsumoto; Tadashi Tamura; Akira Morita; Sigeru Imayasu, all of Moriyama, and Toshio Nomura, Shiga, all of Japan, assignors to Japan Vilene Company Ltd., Toyko, Japan

Filed July 28, 1975, Ser. No. 599,327

Claims priority, application Japan, July 30, 1974, 49-86634; Mar. 20, 1975, 50-33025; May 29, 1975, 50-63512

Int. Cl.² D02G *3/00*; D04H *1/54*

U.S. Cl. 428—224 9 Claims

1. A conjugate filament consisting essentially of from 50 to 95 percent by weight of filament-forming polycarbonate and the balance is filament-forming polypropylene, said polycarbonate component forming a continuous matrix and said polypropylene component existing as a multitude of ultrafine individual fibers that are dispersed throughout the polycarbonate matrix and that extend substantially in parallel to each other for a substantial distance lengthwise of the filaments, whereby the crazing resistance and oil resistance of the filament is improved.

3,996,405

PRESSURE-SENSITIVE RECORD MATERIAL

Erland C. Porter, Jr., Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 326,361, Jan. 24, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,001

Int. Cl.² B41M *5/12*

U.S. Cl. 428—307 3 Claims

1. Record sheet material comprising paper coated with microcapsules containing droplets of an oil solution of base-reacting colorless chromogenic dye-precursor material wherein said oil comprises a mixture of at least about 70 percent, by weight, ethyldiphenylmethane, not more than about 25 percent, by weight, dibenzylethylbenzene and not more than about 7 percent, by weight, polybenzylethylbenzene, and a diluent selected from the group consisting of a high-boiling saturated aliphatic hydrocarbon oil in an amount up to about one-third of the total weight of the oil and mono-C_{10} to C_{15}-alkylbenzene in an amount up to about two-thirds of the total weight of the oil; and with an oil-soluble, acid-reacting zinc salt of phenol-formaldehyde novolak resin capable of producing color in said dye-precursors when brought into reactive contact therewith.

3,996,406

2-PHENYL-1,2,3-TRIAZOLOFLUORAN COMPOUNDS

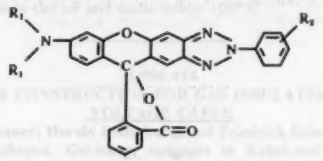
Derek J. Alsop, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 525,989, Nov. 21, 1975. This application Oct. 23, 1975, Ser. No. 625,169

Int. Cl.² B41L *1/20*

U.S. Cl. 428—307 4 Claims

1. In a pressure-sensitive recording system comprising a layer containing a substantially colorless color precursor compound and a layer of an electron-acceptor material, the improvement which comprises utilizing, as said color precursor compound, a chromogenic 2-phenyl-1,2,3-triazolofluoran compound having the following structural formula:



wherein each R_1 represents either a hydrogen atom or a lower alkyl group having from one to five carbon atoms and wherein R_2 represents either a hydrogen atom, a substituted or unsubstituted lower alkyl group having from one to five carbon atoms or a substituted or unsubstituted phenyl group.

3,996,407

MAGNETIC RECORDING MEDIA

Egon Von Gross, Gien, France; Heinz Stritzinger; Job-Werner Hartmann, both of Ludwigshafen, Germany; Manfred Steuerwald, Frankenthal, Germany; Ursula Klein, Mutterstadt, Germany, and Dieter Schaefer, Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 18, 1974, Ser. No. 533,973

Claims priority, application Germany, Dec. 28, 1973, 2364877

Int. Cl.² B32B *5/16*, *9/04*

U.S. Cl. 428—323 8 Claims

1. A magnetic recording medium consisting essentially of a non-magnetizable flexible base and a firmly adhering magnetic coating based on a dispersion of a finely divided magnetic pigment and a silane in a polymeric binder, wherein the silane is an aminoalkylsilane of the formula $R_nSi(OR')_{4-n}$, in which n is 1, 2 or 3, R′ is alkyl of 1 to 8 carbon atoms and R is a radical selected from the group consisting of primary alkylamino and N-(alkylamino)-alkylamino and wherein R contains from 3 to 11 carbon atoms.

3,996,408

CARBON-GRAPHITE BRUSHES FOR ELECTRIC MACHINES AND METHOD FOR MANUFACTURING SAME

Georgy Nikolaevich Fridman, Leninsky prospekt, 67, kv. 40; Jury Nikolaevich Vasiliev, ulitsa Vostrukhina, 6, korpus 3, kv. 67; Abram Samoilovich Fialkov, Kutuzovsky prospekt, 9, kv. 95; Yakov Gilievich Davidovich, Molodezhnaya ulitsa, 3, kv. 333; Abram Yakovlevich Gluskin, ulitsa Scherbakovskaya, 58, kv. 18, all of Moscow; Anatoly Alexandrovich Kozyrev, Sovetskaya ulitsa, 24, kv. 5, Elektrogorsk Moskovskoi oblasti; Roza Petrovna Batyreva, 1 Vladimirskaya ulitsa, 22, korpus 2, kv. 16; Evgeny Mikhailovich Kozlov, Armyansky pereulok, 9, kv. 59, both of Moscow; Anatoly Alexeevich Boiko, Komsomolskaya ulitsa, 7, kv. 38; Olga Borisovna Kazakova, ulitsa Sovetskaya, 5, kv. 25, both of Elektrougli Moskovskoi oblasti; Nadezhda Vasilievna Kalinina, Ketcherskaya ulitsa, 8, korpus 1, kv. 42, Moscow; Valentina Mikhailovna Emelyanova, 13 Parkovaya ulitsa, 20, korpus 3, kv. 62, Moscow, and Igor Vyacheslavovich Yartsev, Zverinetskaya ulitsa, 6, kv. 16, Moscow, all of U.S.S.R.

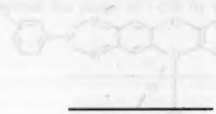
Filed Feb. 28, 1975, Ser. No. 554,211

Int. Cl.² H01R *39/24*, *39/26*

U.S. Cl. 428—408 4 Claims

1. A carbon-graphite brush impregnated with a coating consisting of 0.5 to 10% by weight per weight of brush of a composition containing a melamine-glyptal resin and a metal linoleate in a polymerized state, the composition resulting from one part of oleo-glyptal varnish containing about 16%

melamine and 4 parts of metal linoleate containing up to 15% of metal oxide.



3,996,409

HIGH TEMPERATURE ADHESIVE-SEALANT COMPOSITION

John G. Holloway, Oakmont; Herbert W. Barch, Natrona Heights, and Dennis M. Fahey, Aspinwall, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 389,752, Aug. 20, 1973, Pat. No. 3,898,094. This application Apr. 24, 1975, Ser. No. 571,332
Int. Cl.² C04B 7/32; B32B 15/08, 17/10
U.S. Cl. 428—432 9 Claims

1. An article of manufacture comprising a metallic substrate bonded to a glass substrate by means of an adhesive sealant composition comprising:

a. 75 to 97 percent by weight of a mixture of metal oxides having therein 78 to 99 percent as Al_2O_3 and

b. 3 to 25 percent by weight of an organic compound selected from the group consisting of:

i. the reaction product of an aromatic tetracarboxylic dianhydride and an aromatic diamine,

ii. the reaction product of an aromatic tetracarboxylic dianhydride and a hydrazine,

iii. the reaction product of an aromatic tetracarboxylic acid and a dihydrazide,

iv. the reaction product of an aromatic tricarboxylic monoanhydride and an aromatic diamine,

v. the reaction product of an aromatic tricarboxylic monoanhydride and a hydrazine, and

vi. the reaction product of a tricarboxylic acid and an a hydrazide.

4. A method of bonding a plurality of substrates comprising:

applying to the surface of said substrates to be bonded an adhesive-sealant composition comprising:

a. 75 to 97 percent by weight of a mixture of metal oxides having therein 78 to 99 percent as Al_2O_3 and

b. 3 to 25 percent by weight of an organic compound selected from the group consisting of:

i. the reaction product of an aromatic tetracarboxylic dianhydride and an aromatic diamine,

ii. the reaction product of an aromatic tetracarboxylic dianhydride and a hydrazine,

iii. the reaction product of an aromatic tetracarboxylic acid and a dihydrazide,

iv. the reaction product of an aromatic tricarboxylic monoanhydride and an aromatic diamine,

v. the reaction product of an aromatic tricarboxylic monoanhydride and a hydrazine, and

vi. the reaction product of a tricarboxylic acid and a hydrazide; and

contacting said coated substrates between the coated surfaces and heating the contacted adhesive coated substrates to 600° F.

3,996,410

METHOD AND COMPOSITION FOR TREATING SUBSTRATES AND COATED ARTICLES OBTAINED THEREBY

Stanley A. Gruetzman, Shoreview, Minn., assignor to Andersen Corporation, Bayport, Minn.

Continuation-in-part of Ser. No. 507,371, Sept. 19, 1974, abandoned. This application May 7, 1975, Ser. No. 575,365
Int. Cl.² B05D 1/06
U.S. Cl. 428—539 9 Claims

1. A process for the electrostatic coating of substantially electrically non-conductive inorganic substrate or synthetic organic polymeric substrate comprising the steps of:

a. placing the substrate in substantially continuous motion with a conveying means;

b. directing the substantially continuous motion of the substrate through a treatment zone for the treatment of said substrate with a liquid means comprising a liquid solution for improving its electrical conductivity, said liquid solution consisting essentially of:

98–99.9 percent by weight of a solvent system comprising a lower alkanol and a hydrocarbonaceous co-solvent miscible with said alkanol, said hydrocarbonaceous co-solvent having a boiling point below 140° C.; and

0.1–2 percent by weight of an alkali metal hydroxide dissolved in said solvent system;

c. directing the said substantially continuous motion of the thus-treated substrate, emerging from said treatment zone, through an evaporation zone to an electrostatic spraying zone; and

d. electrostatically spraying the treated substrate with a coating composition in said electrostatic spraying zone.

3,996,411

PRODUCTION OF WATER-SOLUBLE POLYMERS

Iwao Ohshima; Seiichi Chiba, and Kenzo Ariyama, all of Yokohama, Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Japan

Filed July 1, 1974, Ser. No. 484,882
Claims priority, application Japan, July 7, 1973, 48-76722; Aug. 2, 1973, 48-86992; Aug. 2, 1973, 48-86993
Int. Cl.² C08F 2/10, 20/02
U.S. Cl. 526—88 7 Claims

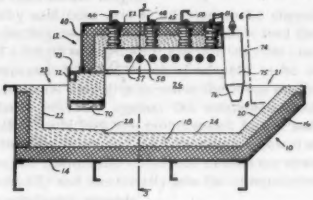
1. A batchwise process for obtaining a hydrogel of a substantially non-fluid water-soluble acrylic polymer by subjecting an aqueous solution containing at least 10% by weight of an acrylic monomer or a mixture of an acrylic monomer with a water-soluble monomer copolymerizable therewith to polymerization to form a hydrogel mass in a polymerization vessel which has an opening wide enough to discharge the mass of the resultant hydrogel therethrough as a whole, the opening being closed during the polymerization but being opened after the polymerization, and in which the mass of hydrogel is unagitated and remains stationary with respect to the polymerization vessel during polymerization and the temperature of the mass of hydrogel is permitted to rise due to the heat of polymerization, and by discharging the mass of hydrogel from the polymerization vessel through the opening, which process comprises allowing the mass of hydrogel (a) to fall through the opening down into a receptor disposed under the opening, thereby discharging same out of the polymerization vessel and (b) to collide, before the mass of hydrogel is received by the receptor, with rigid bar means disposed between the opening and the receptor whereupon the mass of hydrogel is split by said bar means during the course of falling and colliding, undergoes a frictional travel, the friction being between the bar means and the mass of hydrogel, whereby a part of impact force is absorbed through the frictional travel.

3,996,412

ALUMINUM MELTING FURNACE

Carl W. D. Schaefer; Richard L. Schaefer, both of Dayton, and Gordon F. Kennedy, Miamisburg, all of Ohio, assignors to Frank W. Schaefer, Inc., Dayton, Ohio

Filed Jan. 17, 1975, Ser. No. 541,883
Int. Cl.² H05B 3/00
U.S. Cl. 13—20 12 Claims



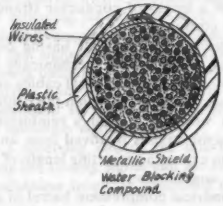
1. In an aluminum melting furnace, a vessel having a floor and side walls for accumulating molten aluminum, arch means traversing said vessel, said arch means having a lower portion spaced above said floor and adapted for submersion in molten aluminum accumulated in said vessel, said arch means by submersion in accumulated molten aluminum dividing said vessel into at least first and second wells interconnected by molten aluminum underflowing said arch means, means cooperating with said vessel, said arch means and the molten aluminum within said first well defining a closed heating chamber above and in communication with said first well, said second well disposed outside said heating chamber, and silicon carbide electrical resistance means supported in said heating chamber above the level to which molten aluminum accumulates in said vessel for radiating sufficient thermal energy directly to the surface of the molten aluminum accumulated in said first well that unmelted aluminum charged to said second well may be melted in said second well by thermal energy conducted from said first to said second well through molten aluminum underlying said arch means.

3,996,413

SHEATHED STRANDED CABLE COMPLETELY FILLED WITH WATER BLOCKING COMPOSITION

Stanley George Foord, Harlow; Walter Eric Simpson, Ware, and Peter Ivan Aitken Martin, Bishops Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Division of Ser. No. 298,811, Oct. 19, 1972, Pat. No. 3,903,013. This application Mar. 24, 1975, Ser. No. 561,540
Int. Cl.² H02G 15/20; H01B 7/28
U.S. Cl. 174—23 C 6 Claims



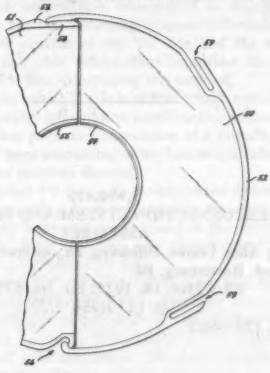
1. A sheathed stranded cable completely filled with a water blocking composition, said composition being room temperature pumpable and consisting essentially of a gel of a major proportion by weight of a substantially non-volatile petroleum based-oil, in which is dispersed a minor proportion of from 0.5 to 10% by weight of the total composition of a solid gellant which is insoluble in said oil and which does not melt below 100° C, the gel being substantially devoid of any gellant which is soluble in the oil and melts below 100° C.

3,996,414

SPACER CONSTRUCTION FOR GAS INSULATED HIGH VOLTAGE CABLE

Jan Arthauer; Harald Roderburg, and Friedrich Schatz, all of Langenhagen, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed July 26, 1973, Ser. No. 382,916
Claims priority, application Germany, July 27, 1972, 2236854
Int. Cl.² H01B 9/04
U.S. Cl. 174—28 14 Claims



1. In a gas insulated high voltage cable having an outer tubular, corrugated conductor and an inner centrally disposed conductor, a spacer construction for holding and spacing the inner conductor in the tubular outer conductor, comprising:

two spacer elements of semi-annular construction each and complementing each other for establishing a closed annulus, each element constructed for lateral slipping onto the inner conductor; a plurality of tangentially extending tongues on the outer periphery of the annulus undergoing radial deflection upon engagement with the outer conductor and resiliently bearing thereagainst; and

means for securing the spacer elements to each other to establish the closed annulus in positive disposition on the inner conductor.

3,996,415

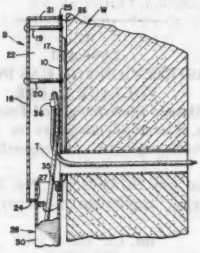
EASY TO INSTALL TELEPHONE SERVICE BRACKET

Clifford Provorse, 710 E. 10th St., Coffeyville, Kans. 67337

Filed July 3, 1975, Ser. No. 593,127
Int. Cl.² H02G 3/22
U.S. Cl. 174—48 12 Claims

1. An easy to install bracket for telephone and television service and the like, comprising a substantially rectangularly shaped plate having a wire-receiving opening therethrough and a front surface and a back surface, means extending rearwardly from the plate and into a wall of a building securing the plate to the wall in upwardly spaced relation from the ground, a cover secured to the plate over the front surface thereof, said cover including a top wall, a front wall and opposite side walls, and a tubular wire protector extending upwardly from the ground to adjacent a bottom edge of the cover to enclose and protect a service wire leading from the ground to the bracket, said tubular protector comprising a

pair of elongate channel members having interengageable detent means thereon for snap-fitting engagement to releasably snap the channel members together to form the tubular protector.

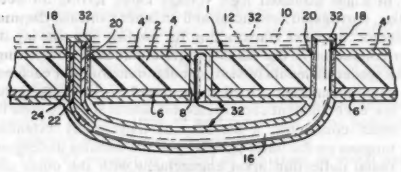


3,996,416

INTERCONNECTION SYSTEM AND METHOD OF ASSEMBLY

Timothy Allen Lemke, Dillsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 18, 1975, Ser. No. 559,621
Int. Cl.² H05K 3/20
U.S. Cl. 174—68.5 1 Claim



1. A system of transmission lines interconnected between spaced locations of a substrate and projecting above a metal layer of the substrate, comprising:

a substrate being clad with first and second metal layers, a plurality of apertures defined through said substrate and said first and second metal layers, a plurality of transmission lines forming loop portions over said first metal layer and having end portions of the transmission lines projecting through corresponding apertures, the end portions of said transmission lines also projecting respectively at selected distances beyond said second metal layer, material solidified in place filling said defined apertures and sealably encircling said end portions of said transmission lines, said material sealing said first metal layer from said second metal layer and rigidifying the end portions of said transmission lines which project beyond said second metal layer, said first metal layer forming discrete electrical pads encircling both the corresponding projecting end portions of said transmission lines and said encircling material, and

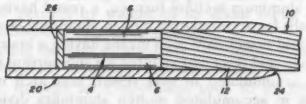
metal plating adhered to the projecting ends of said transmission lines and being spaced from and electrically isolated from said second metal layer.

3,996,417

CABLE CORE GRIP, ELECTRICAL CABLE AND CONNECTOR ASSEMBLY, AND ELECTRICAL CONNECTOR KIT

Nick S. Annas, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 505,326, Sept. 12, 1974, abandoned.
This application Dec. 8, 1975, Ser. No. 638,305
Int. Cl.² H01R 5/10; F16G 11/02
U.S. Cl. 174—90 19 Claims



1. An elongate core grip of deformable metal adapted to be mechanically joined to the core member in a reinforced cable by crimping a surrounding compression barrel inwardly against the core grip, said core grip comprising a plurality of longitudinally extending radially outwardly projecting lobes of decreasing circumferential extent toward the axis of the core grip, comprising ⅓ to ⅜ of the circumference of the core grip and integrally interconnected in spaced relation about a common axis by a deformable sleeve at the inner edges of the lobes having a central bore therethrough for receiving a projecting length of core from a cable to be connected thereby, said sleeve having a wall thickness less than 25% of the arc length of the sleeve between adjacent lobes to facilitate buckling of the sleeve between the lobes upon crimping of a compression barrel inwardly against the core grip.

6. The combination of a cable connector joined to an electrical conductor cable having a reinforcing core therein comprising, an elongate core grip of deformable metal and having a plurality of longitudinally extending radially outwardly projecting lobes integrally interconnected in spaced relation about a common axis by, and projecting radially outward from, webs buckled outwardly between the lobes and having a central bore therethrough with the projecting end of the cable core locked therein by gripping contact between such bore and the outer surface of the cable core, each of said lobes being of decreasing circumferential extent toward the axis of the core grip, and an elongate compression barrel of conductive metal disposed around and compressed against said core grip and against a length of conductor strands on the cable adjacent to the core grip.

15. An electrical connector kit having component parts capable of being assembled for mechanically and electrically joining two core-reinforced electrical cables or one such cable and an electrical accessory, in which the cable has conductor strands therein wrapped around a reinforcing central core with the conductor strands removed from an end portion of the conductor to expose a projecting length of the core, the kit comprising the combination of:

a hollow cylindrical compression barrel of electrically conductive metal open at both ends and adapted to have an end portion of a conductor inserted in at least one end of the barrel;

at least one elongate core grip of deformable metal adapted to be inserted in one end of the compression barrel along with the end of the conductor, said core grip having an

outer extent less than the inside diameter of said compression barrel and comprising a plurality of longitudinally extending lobes in spaced relation about the center axis of the core grip and comprising ⅓ to ⅔ of the circumference of the core grip, said lobes being integrally interconnected by, and projecting radially outwardly from, deformable webs therebetween which, with said lobes, define a bore through the core grip for receiving and confining a projecting length of core from a cable to be joined, each of said connecting webs having a thickness less than its arc length;

whereby said core grip is adapted to be slipped over the projecting end of a core from a cable and the core grip and a length of conductor inserted into the one end of the compression barrel which is adapted to be compressed against said core grip to move the lobes on the core grip radially inwardly against the contained cable core to mechanically lock the compression barrel and core grip on the cable core and the compression barrel additionally crimped against the contained conductor strands to mechanically and electrically join the compression barrel to the conductor strands.

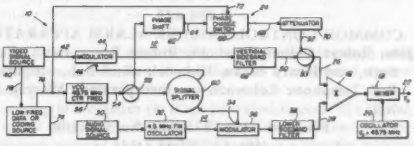
3,996,418
SCRAMBLER AND DECODER FOR SECURE TELEVISION SYSTEM

William D. Murphy, Burlington, and Gerald Aaronson, Brookline, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 494,653, Aug. 5, 1974, Pat. No. 3,936,593. This application Sept. 2, 1975, Ser. No. 609,878

Int. Cl.² H04N *1/44*

U.S. Cl. 178—5.1 **26 Claims**



1. A scrambling and decoding apparatus for a television system comprising:

a. means for generating a coding signal having a pair of alternating signal levels,

b. means for frequency modulating a normal carrier with the coding signal,

c. means for amplitude modulating the frequency modulated normal carrier with a television signal,

d. means for replacing the normal carrier in the television signal modulated normal carrier with a scrambling carrier during the first signal level intervals of the coding signal, the scrambling carrier having the same frequency as the normal carrier and having a different predetermined phase relationship to the normal carrier to produce a scrambled television signal,

e. means at a receiving end of the television system for regenerating the coding signal and for removing the frequency modulation from the scrambled television signal, and

f. means responsive to the regenerated coding signal for replacing the scrambling carrier of the scrambled television signal with a regenerated normal carrier during the first signal level intervals of the regenerated coding signal to decode the scrambled television signal.

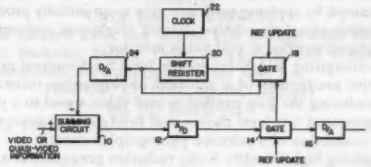
3,996,419
TECHNIQUE FOR MINIMIZING MULTI-PATH DISTORTION EFFECTS IN VIDEO TRANSMISSION

Paul G. Kennedy, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 27, 1975, Ser. No. 580,860

Int. Cl.² H04N *5/21*

U.S. Cl. 178—6 **4 Claims**



1. A method for reducing the distortion characteristics of video bandwidth information transmitted in television line format, wherein the non-recurring program information comprises the active portion of the TV line and the recurring blanking, sync and code information comprises the inactive portion of the TV line, comprising the steps of,

transmitting an initial TV line without said non-recurring video bandwidth information in said active portion of said initial TV line prior to transmission of a plurality of successive TV lines containing video bandwidth information in the active portions thereof,

storing said initial TV line with the attendant distortion and reflections resulting from transmission interference with the recurring information contained in the inactive portion of said initial TV line, said stored initial TV line comprising a reference TV line,

transmitting successive TV lines following said initial TV line, said successive TV lines containing non-recurring video bandwidth information in the active portions thereof, and recurring information in the inactive portions thereof, said successive TV lines comprising program information TV lines, and

combining said reference TV line with each of said successively transmitted program TV lines to effectively minimize the distortion and reflection introduced in said successively transmitted program information TV lines resulting from transmission interference with the recurring information of said program information TV lines.

3,996,420
X-RAY EXAMINATION

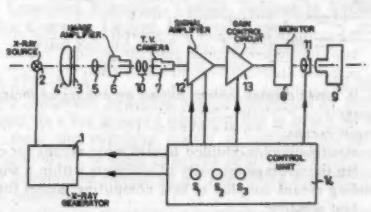
Ronald Jan Geluk, Nootdorp, Netherlands, assignor to N.V. Optische Industrie de Oude Delft, Delft, Netherlands

Filed Oct. 10, 1974, Ser. No. 513,528

Claims priority, application Netherlands, Oct. 11, 1973, 7313999

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **10 Claims**



1. A method of X-ray examination and producing selected photographic records therefrom comprising the steps of:

applying X-ray radiation generated at a first level from an

X-ray source to a subject to be examined and forming an X-ray image therefrom, said first level being selected at a value to permit extended periods of continuous examination of a subject without harmful consequences;

forming an optical image corresponding to said X-ray image;

producing an amplified video signal corresponding to said optical image and applying said amplified video signal to a video monitor, said amplified video signal being obtained by applying sufficient gain to an initially produced video signal to achieve desired brightness and contrast characteristics at said video monitor;

de-energizing said X-ray source for a brief interval prior to the production of a selected photographic record and reducing the gain applied to said video signal to a predetermined low level during said brief interval prior to the production of a selected photographic record;

applying high intensity X-ray radiation generated in a short burst at a second level from said X-ray source to a subject being examined and forming X-ray and optical images therefrom, said second level being of sufficient magnitude to produce an optical image having high persistance and said low level gain established during said interval causing the amplitude of the resulting video signal during the presence of said short burst of high intensity X-ray radiation to correspond approximately to that obtained for amplified video signals resulting from X-ray radiation at said first level; and

increasing the gain applied to said video signal in accordance with a predetermined function of time to cause said amplified video signal to exhibit substantially constant magnitude characteristics during said persistance of said optical image upon a termination of said short burst of high intensity X-ray radiation,

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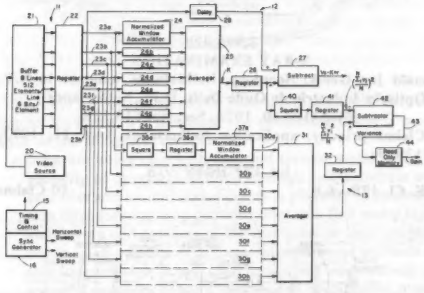
3,996,421
TELEVISION DISPLAY UTILIZING LOCAL AREA BRIGHTNESS CONTROL

Michael D. Pruznick, Huntington Beach; David J. Ketcham; Roger W. Lowe, both of Lakewood, and Eugene W. Opittek, Santa Ana, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 2, 1975, Ser. No. 609,753
Int. Cl.² H04N *5/14, 5/20*
U.S. Cl. 178—7.3 D **7 Claims**



1. A raster display system having an enhanced image, comprising:

input means;

computing means coupled to said input means for computing the average intensity of elements within a window;

sliding means coupled to said computing means for sliding said window;

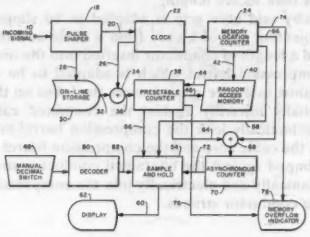
output means coupled to said sliding means for adjusting the intensity of an element within a window in response to the average intensity of the elements within said window; and

display means coupled to said output means.

3,996,422
MULTIPLE CHANNEL DECOMMUTATOR ACCUMULATOR

Charles A. Eixenberger, Post Falls, Idaho, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1975, Ser. No. 625,360
Int. Cl.² H04M *15/00;* **H04J** *3/04*
U.S. Cl. 179—15 A **3 Claims**



1. A multiple channel decommutator accumulator comprising:

a. clock means for producing a series of clock pulses;

b. first counter means connected to said clock means for producing a memory address signal representative of said clock pulses counted by said first counter means;

c. storage means for producing a memory output signal in response to said memory address signal;

d. second counter means for adding said memory output signal to produce a cumulative memory storage signal for storage in said storage means;

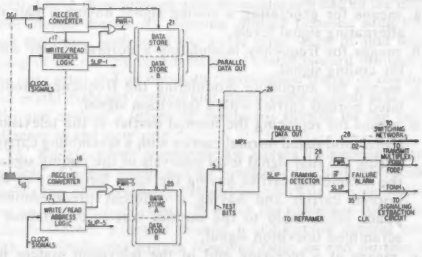
e. means for sampling and holding said cumulative memory storage signal for display; and,

f. an asynchronous counter for counting overflow pulses from said second counter.

3,996,423
COMMON CONTROL FAILURE ALARM APPARATUS

John Robert Colton, Freehold; Robert Bruce Heick, Eatontown, and Henry Mann, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1975, Ser. No. 633,108
Int. Cl.² H04J *3/14*
U.S. Cl. 179—15 BF **8 Claims**



1. In a time division multiplex system wherein a plurality of digital groups of time division multiplexed channels are time multiplexed together on to a common transmission link, a failure alarm circuit comprising timing store means for timing one or more selected failure indications for each digital group, status store means for maintaining a continuing real time record of the alarm status for each digital group, and decoder means for setting the alarm status record for a digital group to

the alarm state and for clearing the timing store means for the digital group when the timing store means counts out a predetermined failure duration, said timing store means serving to time failure-free indications for a digital group after the alarm state is recorded for the same, said decoder means terminating the alarm state recorded for a ditigal group and clearing the timing store means for the digital group after said timing store means counts out a predetermined failure-free duration.

3,996,424

ELECTRONIC TELEPHONE SYSTEMS

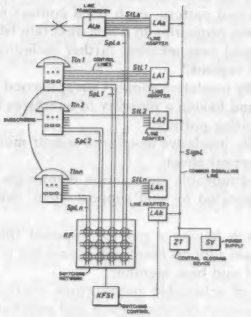
Manfred Agricola, Bad Vilbel, Germany, assignor to Telefonbau und Normalzeid G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 23, 1974, Ser. No. 499,895

Claims priority, application Germany, Aug. 29, 1973, 2343498

Int. Cl.² H04J 3/12

U.S. Cl. 179—18 J 3 Claims



1. A process for establishing connections between subscriber stations or line transmissions in a telephone system including the steps of

a. storing in a register (H Reg) provided in each of a plurality of subscriber stations (T1n1, T1n2....T1nn) or line transmissions (AUe) of which each has a specific address the momentary status thereof and also the address of another of said plurality of subscriber stations or line transmissions intended to be called, said momentary status information and said address of another of said plurality of subscriber stations or line transmissions jointly forming specific signal words;

b. assigning a specific time slot to each of said plurality of subscriber stations or line transmissions, cyclically scanning said plurality of subscriber stations or line transmissions and transmitting from some of said plurality of subscriber stations or line transmissions said stored specific signal words thereof by way of a signal line (SignL) to all the other of said plurality of subscriber stations or line transmissions;

c. causing each of said plurality of subscriber stations or line transmissions whose address is included in one of said specific signal words received by it to add to said specific signal word an answer signal describing the own status thereof and to transmit said answer signal to said signal line; and

d. supplying a complete data word formed by combining one of said specific signal words and said answer signal immediately following said one of said specific signal words by way of said signal line to a switching control unit (KFSt) and causing said switching control unit to control a switching network (KF) so as to connect one of said pluraliy of subscriber stations or line transmissions having transmitted one of said specific signal words to another of said plurality of subscriber stations or line transmissions who gave an answer signal to said one of said specific signal words.

3,996,425

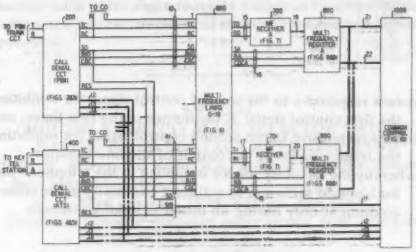
CALL DENIAL CIRCUIT

Arnold Edward Low, San Mateo, and Michael John Sturtevant, Berkeley, both of Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1975, Ser. No. 625,321

Int. Cl.² H04M 1/66

U.S. Cl. 179—18 DA 17 Claims



1. A call denial arrangement for restricting completion of selected calls being placed over a plurality of telephone lines to a central office comprising

rotary dial pulse recording means individual to each of said lines responsive to the receipt of signals thereover for recording rotary dial pulsed call directing digits,

multifrequency recording means common to all of said lines operable for recording multifrequency signaled call directing digits,

common means selectively connectable to individual ones of said lines for checking the recorded contents of said individual dial pulse recording means, and for generating a restrict signal when a denied call is determined,

gating means associated with said individual lines being selectively enabled for coupling the associated one of said rotary dial pulsed recording means to said common checking means, and

means for temporarily associating said multifrequency recording means with a calling one of said lines, said gating means including means for coupling an associated multifrequency recording means to said common checking means.

3,996,426

PROTECTION CIRCUIT FOR TELEPHONE SWITCHING SYSTEM

Robert Lancaster, Brampton, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Feb. 23, 1976, Ser. No. 659,996

Int. Cl.² H04M 1/00

U.S. Cl. 179—84 A 4 Claims

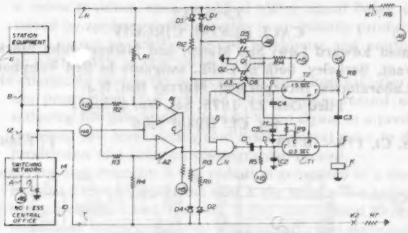
1. In a telephone switching system connected to station equipment via a line powered telephone line in which the line voltage from the switching system is removed during its switching interval; an open switching interval protection circuit, for maintaining voltage on the line during said switching interval, comprising:

a line monitor for generating a momentary trigger signal in response to the loss of voltage on said line;

a first timer responsive to said trigger signal for generating a first control signal for a period which exceeds the switching interval;

a control means responsive to said first control signal for connecting a source of voltage to said telephone line;

a second timer responsive to the termination of said first control signal for generating a second control signal which exceeds the time interval required to clear the station equipment on the telephone line;



means responsive to the second control signal for inhibiting the first control signal at the output of the first timer; and

means responsive to the second control signal for inhibiting the trigger signal at the output of the line monitor;

whereby the auxiliary source is applied to the telephone line for a period sufficient to maintain continuity in the station equipment only during an initial switching interval.

3,996,427

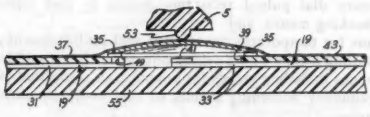
PUSHBUTTON KEYBOARD SYSTEM AND METHOD OF MAKING SAME

Perry W. Kaminski, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,468

Int. Cl.² H01H *13/52*

U.S. Cl. 200—5 A **8 Claims**



1. A low profile keyboard having the keyboard switches and all associated circuitry in a single side of the board comprising a substrate having a relatively flat surface, a network of circuit paths disposed on the flat surface, a plurality of inner contact portions of electrically conductive material disposed on certain portions of the circuit paths, a dielectric layer disposed on the flat surface over selected portions thereof and leaving exposed the inner contact portions, a plurality of outer contact portions of electrically conductive material disposed on the dielectric layer, means electrically connecting the plurality of outer contact portions with other portions of the circuit paths, an outer contact portion of the plurality of contact portions disposed adjacent each inner contact portion, the top surface of the outer contact portion spaced from the flat surface of the substrate a distance greater than the distance of the top surface of the inner contact portion from the said flat surface, a switch actuating element disposed on each outer contact portion and retaining means disposed on the substrate to maintain the actuating elements in position relative to their respective contact portions.

3,996,428

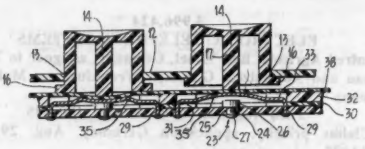
PUSHBUTTON KEYBOARD ASSEMBLY WITH OVER CENTER DIAPHRAGM CONTACT

Danilo P. Buan, Fremont, and Richard F. Kingsbury, San Jose, both of Calif., assignors to Litronix, Inc., Cupertino, Calif.

Filed Mar. 17, 1975, Ser. No. 558,585

Int. Cl.² H01H *13/70, 1/06*

U.S. Cl. 200—5 A **19 Claims**



1. A keyboard assembly comprising:

an electrically insulative member having a plurality of fixed electrically conductive contact elements arranged in a predetermined pattern, each fixed contact element having a portion projecting in a first direction from said base member, said base member further including a plurality of contact regions;

an electrically insulative support sheet carried by said base member and having a plurality of apertures for receiving said projecting portions;

an electrically insulative apertured spacer member carried by said support sheet;

a plurality of movable snap action diaphragm contact elements supported by said support sheet, said diaphragm contact

elements each having a pair of opposed tines extending through said support sheet and connected to said contact regions of said base member;

a plurality of actuatable pushbuttons overlying said diaphragm contact elements, each said pushbutton having a central spindle extending in a direction generally opposite said first direction and adapted to be coupled to one of said diaphragm contact elements; said apertured spacer member enabling the coupling between said spindles and said diaphragm contact elements and

a top cover member having a plurality of apertures for receiving said pushbuttons.

3,996,429

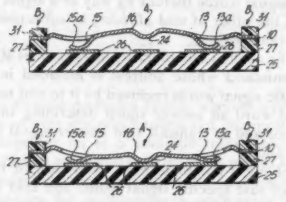
MULTI-CONTACT PUSH-BUTTON SWITCH HAVING PLURAL PRESTRESSED CONTACT MEMBERS DESIGNED TO PROVIDE PLURAL CIRCUIT SIMULTANEOUS SWITCHING INPUTS

Pak-Jong Chu, and Cornelis Wilfred Reedyk, both of Ottawa, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Apr. 18, 1975, Ser. No. 569,359

Int. Cl.² H01H *13/70, 1/06, 5/00*

U.S. Cl. 200—5 A **3 Claims**



1. A multiple pushbutton switch comprising:

a flat spring plate having a plurality of integral switch positions thereon;

each switch position comprising a prestressed domed portion extending upwardly from said flat spring plate and completely surrounded by a flat portion of said flat spring plate, said flat portion circumferentially constraining said domed portion, said domed portion including a center portion and a plurality of radial webs connecting said center portion and said portion of said flat spring plate surrounding the domed portion and integral therewith, each radial web having an upwardly bent portion at its junction with said portion of said flat spring plate, said webs radially constrained by said flat portion of said spring plate;

a central contact on said centre portion;

a plurality of cantilevered spring contact members extending from said center portion, a contact member between each pair of radial webs and extending a radial distance less than said radial webs;

each spring contact member extending radially outward from said center portion and downwardly therefrom and including a contact area at a radially outwards end thereof;

a circuit member positioned below and spaced from said flat spring plate and including contact areas on said circuit member beneath said spring contacts and a further contact area on said circuit member beneath each central contact;

a plurality of pushbuttons mounted above said flat spring plate, a button over each domed portion to apply a downward force on the related center portion each said domed portion, on application of said downward force, arranged to snap downward towards said circuit member and to bend each of said webs adjacent to and radially inward of said upwardly bent portion to produce a return force on said domed portion;

said contact areas on said spring contact members at each switch position extending below the related central contact, to make contact with said contact areas on said circuit board beneath said spring contacts before said central contact makes contact with said further contact area on said circuit board, on application of said downward force on said center portion.

3,996,430

KEYBOARD SWITCH ASSEMBLY HAVING MULTILAYER PRINTED CIRCUIT STRUCTURE

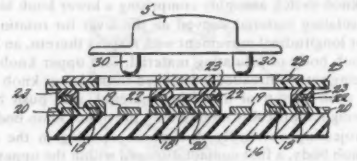
Helmut Eberwein, Brendlorenzen, and Wolfgang Scherzer, Bad Neustadt, Saale, both of Germany, assignors to Preh Elektrofeinmechanische Werke, Bad Neustadt, Saale, Germany

Filed May 2, 1975, Ser. No. 574,081

Claims priority, application Germany, May 7, 1974, 7415872[U]

Int. Cl.² H01H *9/00, 13/52;* **H05K** *1/00*

U.S. Cl. 200—5 A **5 Claims**



1. In a ultrasonic remote control device with integrated switching networks formed in a multilayer printed circuit, a keyboard having a plurality of keys and mechanical switching means, the improvement of a keyboard switch assembly wherein a part of the conductor paths from the outlets and/or inlets of said integrated switching network is arranged in a cross connection matrix in said multilayer printed circuit, said printed circuit including the conductor paths and the contact places comprising an insulated material mounting plate on which first ones of the conductor paths and contact places are applied in the screen printing technique, a first insulating layer printed thereon, which has openings for the contact places and for the conductor paths at predetermined places, second ones of the conductor paths being printed, on the first insulating layer for contacting at determined openings the conductor paths of the lower layer, a second insulating layer provided on the first insulating layer and the second conductor paths and having at predetermined places openings for the contact places and that the mechanical switching arrangement is disposed upon the second insulating layer, wherein said mechanical switching means comprises a plurality of elongated flexible contact reeds mounted so as to be movable by said keys into contact with said printed circuit, and whereby at every intersection each of the two conductor paths can be simultaneously connected by said mechanical switching means to a common potential.

3,996,431

MULTIPLE CIRCUIT SLIDE SELECTOR SWITCH HAVING FIXED CONTACT RETAINING BAND

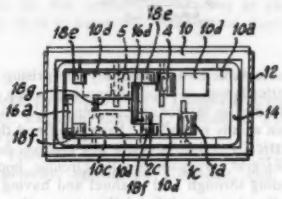
Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

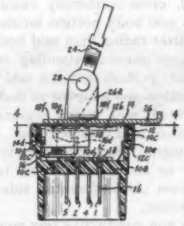
Filed June 19, 1974, Ser. No. 480,740

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² H01H *15/04*

U.S. Cl. 200—16 C **10 Claims**





1. A multiple circuit selector switch having a plurality of operating positions for energizing corresponding electric circuits comprising:

a switch housing including an insulating base and a cover forming a compartment for the switch contacts and a plurality of slots in the bottom of said base, each said slot having a through-portions extending all the way through the bottom of said base and a partial-portion extending partway down into the bottom of said base near an adjacent wall of said base;

a plurality of formed, one-piece stationary contact-terminals in said slots having terminals extending out through said through-portions in the bottom of said base and having wings in said partial-portions of the slots extending

toward adjacent walls of said base and having stationary contacts within said compartment;

an insulating retainer lining walls of said compartment, being held down by said cover and having lower portion over said wings for retaining said stationary contact-terminals fixed in their slots;

a contact actuator block reciprocally movable in said compartment;

a spring-biased movable bridging contact carried by said actuator block for engaging said stationary contacts selectively;

operating means for actuating said actuator block;

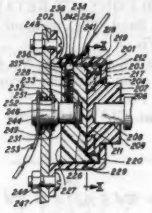
and mounting means on said housing for mounting said switch to a support.

3,996,432

KEY CONTROLLED ALARM ACTIVATING SYSTEM

Christopher M. Sikora, 18 W. 276 Buckingham Lane, Villa Park, Ill. 60181

Filed Sept. 17, 1975, Ser. No. 614,076
Int. Cl.² H01H 27/06
U.S. Cl. 200—44 **7 Claims**



1. A key-actuatable switch assembly compris.ng:

A. an electrically non-conductive housing having cylindrical side walls and an interconnecting end wall, said end wall having an axially extending channel defined therein,

B. an electrically non-conductive key receiver having:

1. an integral, cross-sectionally circular body portion extending through said channel and having an axially extending keyway defined therein on the outer face thereof,

2. an integral, cross-sectionally circular base portion coaxial with said body portion located in said housing having a shorter radius than said body portion,

3. integral flange means extending radially outwardly from said body portion between said body portion and said base portion and adapted to make sliding face-to-face engagement with inside regions of said housing located adjacent said channel, and

4. a pair of integral wings extending in radially opposed relationship to one another and radially outwardly extending from circumferential side wall portions of said base portion,

C. an electrically non-conductive ring member for positioning interiorly of said housing generally coaxially therewith having:

1. a cross sectionally circular aperture defined in the forward face thereof which is adapted for receipt therein of said base portion,

2. a pair of arcuately extending recesses defined in said forward face and radially outwardly extending from circumferential side wall portions of said aperture in said ring member, said recessed portions being adapted for receipt therein of said wing means, said recessed portions cooperating with said wing means to permit limited rotational movement of said wing means relative to said recessed portions between radially extending circumferentially spaced engagement positions therebetween,

3. a radially extending passageway defined therein between at least the central region thereof and a circumferentially extending side wall portion thereof,

D. an electrically conductive ball means positioned in the radially outer mouth of said passageway and including electrically conductive biasing means which both yieldingly urges said ball means radially outwardly away from said ring member,

E. at least one first electrically conductive contact means extending through a portion of said cylindrical side walls of said housing, said first contact means being radially and axially aligned with said ball means,

F. a second electrically conductive contact means adapted for making electrical contact with said ball means, said second contact means being so located relative both to said ball means and to said first contact means that an electrically conductive path between said first and said second contact means exists only when said ball means is engaged with said first contact means through rotational movement of said key receiver relative to said housing, and

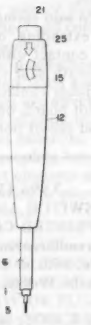
G. electrical connector means functionally associated with each of said first and said second contact means.

3,996,433

LEVER SWITCH STRUCTURE

Masaru Suzuki, Chiryu, and Atushi Takemura, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Oct. 15, 1974, Ser. No. 514,823
Claims priority, application Japan, Apr. 4, 1974, 49-38890
Int. Cl.² H01H 3/16, 9/00, 13/64
U.S. Cl. 200—61.27 **4 Claims**



1. A lever switch structure for use in a motor vehicle, comprising:

an elongated, hollow, conductive lever having at one end thereof a knob switch assembly and having at the other end thereof a direction indicator switch assembly;

the knob switch assembly comprising a lower knob body of insulating material sleeved on the lever for rotation and for longitudinal movement with respect thereto, an upper knob body of insulating material, said upper knob body being screw threadedly attached to the lower knob body, a push button of insulating material, said push button being reciprocably mounted on the upper knob body and projecting outwardly through an opening in the upper knob body, a first contact disposed within the upper knob body and connected in conductive relationship to the lever, a second contact opposed to the first contact and insulation means connecting the second contact to said one end of the lever so that the second contact is mounted on said one end of the lever and is electrically insulated from the lever, the first contact being mechanically coupled to the push button for movement into and

out of contact with the second contact in response to movement of the push button;

the upper knob body having indicia on the external surface thereof for indicating the type of load circuit controlled by the lever switch, the push button projecting from the outer end of the upper knob body and being movable in a direction lengthwise of the lever, the first contact being fixedly connected to the push button for movement therewith, the push button having one or more engaging portions slidably disposed in one or more grooves in the upper knob body for guiding movement of the push button lengthwise of the lever and for preventing rotation of the push button relative to the upper knob body;

an insulated conductor connected to the second contact and extending lengthwise within the lever and being electrically insulated therefrom;

rotation stopper means mounted on the lever adjacent said one end thereof and disposed within the upper knob body, the rotation stopper means being clamped between the upper knob body and the lower knob body so that the upper end of the lower knob body abuts against the lower surface of the rotation stopper means, the rotation stopper means including a conductive plate-form stopper member connected to the lever, and the rotation stopper means comprising at least one tab extending transversely to the lever and being received in one or more grooves in the upper knob body;

spring means urging the push button to its outer position wherein the first and second contacts are out of contact with each other, said spring means being a conductive coil spring disposed between the first contact and the rotation stopper means; and

internal groove means provided on the upper knob body and engaging the rotation stopper means and fixing the upper knob body against rotation relative to the lever.

3,996,434

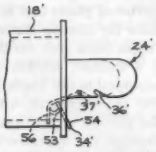
HOUSEHOLD FREEZER DOOR ALARM SWITCH HAVING AN AUTOMATIC RESETTING DEACTIVATOR

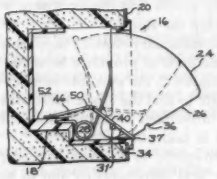
James R. Griffin, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 23, 1975, Ser. No. 570,737

Int. Cl.² H01H *3/20, 9/20*

U.S. Cl. 200—61.79 **4 Claims**





1. In a household freezer having a door and a door-alarm system including a door-alarm switch, said switch having a housing, a plunger movably connected to the housing for movement between switch-open and switch-closed positions, a pair of electrical contacts arranged to open and close in response to inward and outward movement of the plunger resulting from closing and opening of the freezer door, the electrical contacts being connected to actuate the alarm system when the door is open and the plunger is in the switch-closed position and to deactivate the alarm system when the door is closed and the plunger is in the switch-open position, the improvement comprising:

a pair of opposed pivot openings on opposed inner walls of the housing;

a holding element of generally "U" configuration and having first and second legs pivotally connected within the housing to the housing for movement of the holding element between a free position at which the holding element is substantially within the housing to prevent interference with the door and at which the plunger is free to move between the switch-open and switch-closed positions, and a holding position at which the bight portion of the holding element contacts and releasably maintains the plunger at a deactivated position between the switch-open and switch-closed positions and at which the electrical contacts are open, said holding element extending about the plunger and having an outwardly-extending protrusion on each leg with each protrusion pivotally positioned within a respective housing pivot opening;

a groove formed on said plunger for receiving and releasably maintaining the bight portion of the holding element at the holding position, said groove configured to release the holding element when the plunger is further depressed from the deactivated toward the switch-open position; and

means within the housing for biasing the holding element from the holding position towards the free position;

whereby the holding element moves from the holding position to the free position in response to closing of the freezer door to automatically reset the alarm system.

3,996,435

ELECTRICAL SWITCH CONSTRUCTION

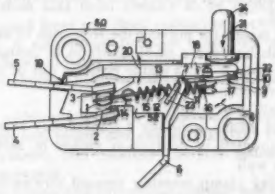
Albert King, Rietheim, Germany, assignor to Firma J. & J. Marquardt, Germany

Filed Oct. 10, 1975, Ser. No. 621,592

Claims priority, application Germany, Oct. 16, 1974, 2449120

Int. Cl.² H01H *13/28*

U.S. Cl. 200—67 B **10 Claims**



1. A switch comprising a housing, first and second spaced apart stop members in said housing, at least one of said stop members comprising an electrical contact, a current carrying contact arm mounted in said housing, a swivel member having a slot through which said contact arm extends and which defines a pivot bearing, and having first and second swivel arm portions on respective sides of said pivot bearing, a movable contact having an inner end pivotal on said first swivel arm portion and having an outer end disposed between and movable between said first and second stop members, a lever member overlying said second swivel arm portion and having an inner end engaged over said second swivel arm portion and an opposite outer end pivoted in said housing, a tension spring connected between said movable contact adjacent the outer end thereof and said lever member adjacent the outer end thereof so that in one position the line of action of the spring

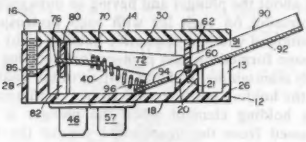
is located above the pivotal connection of said movable contact arm on said swivel member first arm portion to urge said movable contact into engagement with said first stop member and actuator means engageable with said lever arm to move said lever arm to pivot said swivel member to move said spring therewith so that its line of action moves through pivotal connection between said movable contact arm and said first swivel arm portion to move said movable contact into engagement with said second stop member, said spring acting to hold the inner end of said lever member in engagement with said swivel member.

3,996,436

SNAP ACTION SWITCH

Charles Azel Barney, Stow, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Apr. 4, 1975, Ser. No. 565,156
Int. Cl.² H01H 13/28
U.S. Cl. 200—67 A 1 Claim



1. A snap action switch operable by opposite movements of an operating lever comprising

an insulating housing having a pair of transversly spaced longitudinally extending interior walls providing two side compartments and a central compartment and a transverse interior wall extending between said longitudinally extending interior walls across said central compartment adjacent one end thereof, said transverse wall having a transversely extending depression means on its upper surface

an insulating cover for said housing

a pair of fixed terminals, each mounted in one of said side compartments adjacent a side wall of said housing, and

a pair of movable terminals, each mounted in one of said side compartments adjacent one end of said housing and extending along a side wall thereof with its free end movable in and out of contact with a cooperating fixed terminal, and

operating means for moving the free ends of said movable terminals between a stable position in contact with said fixed terminals and a stable position out of contact with said fixed terminals

said operating means including

lever pivot means including a transversely extending pivot shaft mounted in depression means in said transverse interior wall

an overlying clamp member pressed downwardly by said cover against said pivot shaft

a longitudinally extending bifurcated actuating lever having transversely spaced side legs mounted generally centrally in said housing in said central compartment on said pivot shaft for pivotal movement thereon, the free end of said actuating lever having transversely extending insulating portions extending through said longitudinally extending interior walls and connected to the free ends of said movable terminals in said side compartments

a longitudinally extending operating lever mounted generally centrally in said housing in said central compartment on said pivot shaft for pivotal movement thereon,

said operating lever having an external lever portion on the outer side of said pivot shaft extending at least in part externally of said housing and an internal lever portion on the inner side of said pivot shaft extending in the same direction as said actuating lever, positioned between the side legs thereof and having its free end spaced toward said pivot shaft from the free end of said actuating lever and

a compression spring interposed between the free end of said actuating lever and the inner free end of said operating lever and extending beyond the inner free end of said operating lever and between the side legs of said actuating lever

said compression spring normally maintaining:

said actuating lever in one of its two opposite angularly displaced stable positions angularly displaced from and on opposite sides of the inner end of said operating lever and

said operating lever in one of its two opposite angularly displaced stable positions with its inner end portion similarly angularly displaced from said actuating lever

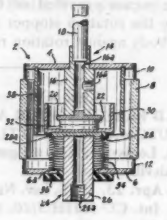
whereby movement of the external portion of said operating lever from one of its stable operating positions into parallelism with said actuating lever compresses said spring, said spring expanding when said levers pass through parallelism to move said levers and said movable terminals into their opposite stable positions.

3,996,437

VACUUM CONTACTOR FOR MOTOR CONTROL AND METHOD OF MAKING

Amos Selzer, Glendale, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 3, 1973, Ser. No. 421,099
Int. Cl.² H01H 33/66
U.S. Cl. 200—144 B 19 Claims



1. A method of making a vacuum contactor from a plurality of prepared parts including an enclosure comprising a pair of spaced apart apertured plates and an envelope comprising an electrical insulator for closing the space between the plates and insulating them from one another, a stationary contact support having a contact portion at one end thereof and adapted to be mounted in the aperture in one of said plates so as to extend into the enclosure, a movable contact support having a contact portion at one end thereof and adapted to extend freely through the aperture in the other plate for engaging the stationary contact, a welded diaphragm bellows adapted to seal the space between the movable contact support and said other plate, and means comprising an evacuation tube providing access into the enclosure to remove air therefrom comprising the steps:

braze said stationary contact support within said aperture in said one plate to provide a hermetic seal therebetween;

weld the bellows to the movable contact support and to said other plate to seal the space therebetween while allowing resilient movement of the movable contact support in the aperture in said other plate;

weld the envelope to the two spaced plates to provide a hermetic seal therebetween and to hermetically seal the enclosure except for the evacuation tube;

bake the vacuum contactor at a temperature up to 450° C while maintaining the inside of the enclosure at a predetermined vacuum by drawing air through said evacuation tube and maintaining the outside thereof in an inert gas environment;

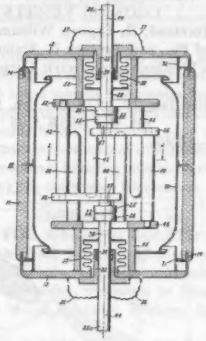
and after a predetermined time of baking close the evacuation tube to completely seal the contacts on the inside from the external atmosphere.

3,996,438

VACUUM-TYPE CIRCUIT INTERRUPTER WITH TWO SETS OF CONTACTS ELECTRICALLY IN PARALLEL

Donald R. Kurtz, West Chester, and Joseph C. Sofianek, Broomall, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed May 19, 1975, Ser. No. 579,122
Int. Cl.² H01H 9/40
U.S. Cl. 200—144 B 17 Claims



1. In a vacuum-type circuit interrupter:

a. a highly evacuated envelope comprising an insulating housing and first and second metal end caps at opposite ends of said housing,

b. a first plurality of rod electrodes within said envelope and means comprising a first conductive tube for mounting said first plurality of rod electrodes on said first end cap and for electrically connecting said first plurality of rod electrodes to said first end cap when the interrupter is open,

c. a second plurality of rod electrodes within said envelope and means comprising a second conductive tube for mounting said second plurality of rod electrodes on said second end cap and for electrically connecting said second plurality of rod electrodes to said second end cap when the interrupter is open,

d. said first and second pluralities of electrodes being positioned so as to form a ring of electrodes within said envelope, the electrodes of said first plurality interleaving with and longitudinally overlapping the electrodes of said second plurality and being spaced circumferentially of said ring from the immediately adjacent electrodes of said second plurality, said electrodes alternating in polarity about said ring when the interrupter is open, whereby inter-electrode gaps are defined between the juxtaposed interleaving electrodes of said first and second pluralities,

e. a first generally stationary contact mounted on the distal end of a rod electrode of said second plurality in a first position on an axis extending longitudinally of said ring and surrounded by said ring,

f. a second generally stationary contact mounted on the distal end of a rod electrode of said first plurality in a second position on an axis extending longitudinally of said ring and surrounded by said ring,

g. said first and second positions being spaced from each other longitudinally of said ring,

h. first and second movable contacts for respectively engaging said first and second generally stationary contacts,

i. a first movable contact rod on which said first movable contact is mounted extending in sealed relationship through said first metal end cap,

j. a second movable contact rod on which said second movable contact is mounted extending in sealed relationship through said second metal end cap,

k. said first conductive tube surrounding said first contact rod, and said second conductive tube surrounding said second contact rod,

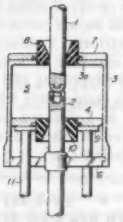
l. said two pairs of engageable contacts being electrically connected in parallel with each other while said interrupter is closed.

3,996,439

PUFFER-TYPE GAS-BLAST CIRCUIT BREAKER

Shunji Tokuyama, and Yoshio Yoshioka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 7, 1975, Ser. No. 539,080
Claims priority, application Japan, Jan. 16, 1974, 49-7098
Int. Cl.² H01H 33/82
U.S. Cl. 200—148 A 11 Claims



1. In a puffer-type gas-blast circuit breaker comprising at least one interrupting unit mounted in a vessel filled with arc extinguishing gas at uniform pressure, said interrupting unit including:

a fixed contact,

a movable contact oppositely aligned with said fixed contact, said movable contact being movable toward and away from said fixed contact to be engaged with and disengaged from said fixed contact respectively, wherein an arc is established between said fixed and movable contacts when being disengaged,

a cylinder having a substantially closed end and an open end,

a piston within said cylinder for defining a puffer chamber between said piston and said substantially closed end of said cylinder, said cylinder and said piston being relatively movable,

means for connecting one of said cylinder and said piston to said movable contact outside said puffer chamber,

a first insulating nozzle mounted through said substantially closed end of said cylinder coaxially with said contacts, and

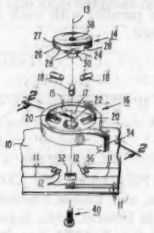
a second insulating nozzle mounted through said piston and aligned with said first insulating nozzle,

said first and second insulating nozzles being separated from one another, each of said first and second insulating nozzles having therein a throat portion for communicating said puffer chamber with the exterior thereof, said throat portions capable of being blocked by at least one of said fixed and movable contacts, and the arc-extinguishing gas being compressed and exhausted from said puffer chamber through said throats toward said contacts upon disengaging movement of said movable contact from said fixed contact.

3,996,440
MULTIPOSITION ROTARY SWITCH WITH DETENT MEANS

Solomon Jacob Niconienko, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,090
Int. Cl.² H01H 1/16
U.S. Cl. 200—155 A 12 Claims

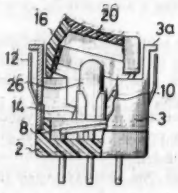


1. A multiposition rotary switch comprising in combination: a housing for supporting a plurality of fixed pairs of electrically conductive switch contacts disposed in a radial array about an axis of rotation, at least one electrically conductive roller adapted to be revolved about said axis to make contact with each pair of said switch contacts in sequence of rotation to provide an electrically conductive path between each switch contact of said pair of contacts, and non-rotatable means for resiliently supporting said roller, said non-rotatable means having means cooperating with said roller for indexing said roller relative to a selected pair of switch contacts to provide for an open or short circuit between the switch contacts of said selected pair.

3,996,441
SWITCH WITH ROCKER ACTUATOR HAVING DETACHABLE COVER

Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamiimagome 1-chome, Oto, Tokyo, Japan

Filed May 17, 1974, Ser. No. 470,899
Claims priority, application Japan, July 9, 1973, 48-80524[U]
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976
Int. Cl.² H01H 9/18
U.S. Cl. 200—309 1 Claim



1. In an illuminated miniature switch including a base formed of an insulating material, a casing consisting of sidewalls extending upwardly from and fixed to the upper part of said base, lamp means within said casing, and a convertor member pivotally supported in said casing and having a rocking motion, corresponding to the rocking motion of a cup shaped operating button, said operating button being formed of a synthetic resin material, possessing some elasticity and including means at one end for detachably attaching one end of said operating button to said pivotally supported convertor the improvement which comprises:

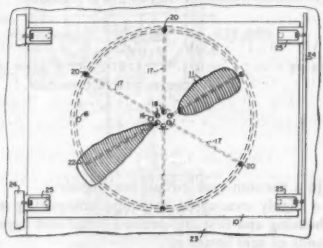
providing an opening in the upper face of said operating button, said opening being defined by a peripheral ledge extending around the periphery of said opening from inwardly inclined walls defining a lower portion of said opening and at least one recess in the lower portion of at least one of said walls; and

providing a cover adapted to be detachably received in said opening and supported on said walls said cover including a projection extending outwardly from said cover and in a direction generally in a plane parallel to the plane of the cover and adapted to be received in the recess in said inclined sidewall of said operating button and to secure said detachable cover in said opening.

3,996,442
INDUCTION HEATING COIL ASSEMBLY FOR HEATING COOKING VESSELS

William C. Moreland, II, Export; William R. Cobb, Murrysville, both of Pa., and Terence D. Malarkey, Tempe, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1975, Ser. No. 542,313
Int. Cl.² H05B 5/08
U.S. Cl. 219—10.49 7 Claims



1. An induction heating coil assembly for heating a cooking vessel comprising:

a multi-turn flat doughnut-shaped induction heating coil having a circular inner periphery defining an open center area and a circular outer periphery, said coil having first and second sides;

a flat rigid support member of low-heat-conductivity material, said member supporting said coil and being adjacent with one of said sides of said coil, said support member having apertures generally adjacent to said peripheries;

retainer clips securing said coil to said member, said clips each extending across the other of said sides of said coil, said clips having at least two end portions, each end portion extending through and secured within at least one of said apertures, said clips each extending radially from said open center area to said outer periphery and being circumferentially spaced about said open center area; and

a horizonal sheet of magnetic-flux permeable material, said support member and said coil and said clips being positioned against the underside of said sheet, said coil and said clips being interposed between said support member and said sheet.

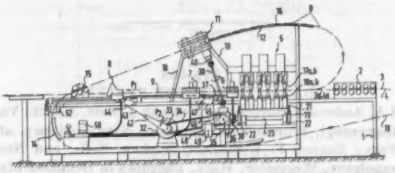
3,996,443
APPARATUS FOR THE MANUFACTURE OF REINFORCEMENT TRUSSES

Klaus Keller, Blumenstrasse 17, 8192 Geretsried 1, Germany

Filed Apr. 23, 1975, Ser. No. 570,848
Int. Cl.² B23K 11/10
U.S. Cl. 219—56 9 Claims

1. Apparatus for the manufacture of composite trusses comprising spaced chords and serpentine-shaped connecting

webs comprising continuously operative bending means for continuously shaping a strand-like material into a serpentine web and for feeding it to a welding station, means for feeding the chord elements to the welding station, welding means operating intermittently at said station and including stationary welding electrodes for welding the spaced chords to the peaks and valleys of said serpentine web to form the composite truss, means to actuate said stationary electrodes on an



intermittent cycle, said bending means being supported in a spaced relation with respect to said welding electrodes so that said serpentine web upon leaving the continuously operating bending means and prior to being fed with said chord elements into the welding means forms a resilient loop and creates a buffer between the continuous output of serpentine web from the continuously operative bending means and its step-wise further processing by the stationary electrodes.

3,996,444
APPARATUS FOR WELDING ROLLED SEAMS

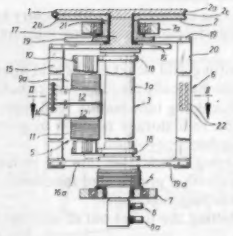
Helmut Benteler, Bielefeld; Franz-Josef Hartmann; Oswald Martens, both of Paderborn, and Helmut Schulz, Paderborn-Marienloh, all of Germany, assignors to Benteler -Werke Aktiengesellschaft Werk Neuhaus, Schloss, Neuhaus, Germany

Filed Feb. 3, 1975, Ser. No. 546,823

Claims priority, application Germany, Feb. 13, 1974, 2406693

Int. Cl.² B23K *11/24*

U.S. Cl. 219—63 **8 Claims**



8. In an apparatus for welding rolled seams, particularly for butt-welding of tube seams, a combination comprising a rotatable shaft having an axis of rotation; a roller electrode having two electrode sections mounted on said shaft for rotation therewith; slip rings also mounted on said shaft; transformer means for converting high-voltage low-amperage net current into low-voltage high-amperage net current, comprising three single-phase transformers each having a primary winding which is electrically connected with said slip rings and which is wound about an axially extending core, and a secondary winding comprised of a plurality of surround windings which are successively arranged in pairs which surround said primary winding in axial direction, each surround winding having a pair of outer terminals; a plurality of first axially extending busbars spaced circumferentially about said axis of rotation, one of said outer terminals being electrically connected with said first busbars so as to collect electrical current for distribution to a first common collecting point which is connected to one of said electrode sections; a plurality of second axially extending busbars also spaced circumferentially about said axis of rotation intermediate said first busbars; and rectifying means for converting electrical net current into DC current, comprising a plurality of diodes mounted on said second busbars and electrically connected with the other of said outer terminals so as to collect electrical current for distribution to a second common collecting point which is connected to the other of said electrode sections, whereby welding currents of high DC amperage are supplied to the roller electrode.

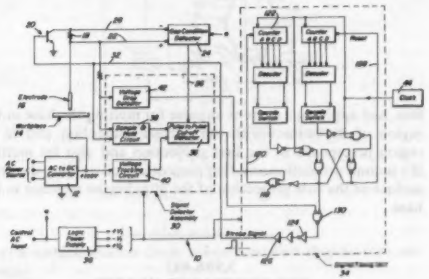
3,996,445
TIMING SEQUENCE CONTROL SYSTEM FOR ELECTRICAL DISCHARGE MACHINING

Leonard M. Wohlabaugh, Miller Place, N.Y., assignor to Eltec Pulsitron (Entire), West Caldwell, N.J.

Filed Feb. 3, 1975, Ser. No. 546,787

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **8 Claims**



1. In combination with a power supply for the electrode and workpiece of an EDM apparatus having switching means for conducting current pulses from a power source through a gap between the electrode and workpiece and timing means connected to the switching means for controlling the duration of and spacing between said pulses respectively, an improvement including a voltage detector connected to said electrode for monitoring the volt drop across the gap, gate means connected to the voltage detector for enabling pulse on-time operation of the timing means in response to a predetermined volt drop across the gap, condition monitoring means connected to the electrode and workpiece for detecting fault conditions, and pulse cut-off means connected to the condition monitoring means for disabling operation of the timing means independently of said pulse on-time operation in response to detected fault conditions to vary the spacing between said pulses.

3,996,446
ATTACHMENT MEMBERS ARRANGED FOR WELD FASTENING TO A METALLIC BASE

Dankmar Tauern, Triesenberg, and Rainer Wild, Schaan, both of Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

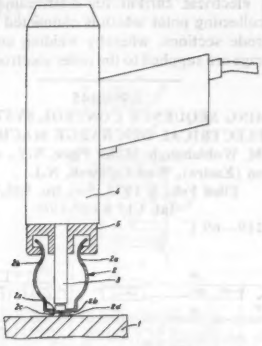
Continuation of Ser. No. 355,659, April 30, 1973, abandoned, which is a continuation of Ser. No. 109,466, Jan. 25, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,621

Int. Cl.² B23K *9/20*

U.S. Cl. 219—99 **2 Claims**

1. A method of securing a planar surface web of a metallic attachment member having a first projection with an areal surface extending outwardly from the planar surface of the web and a second projection approximately centered on said first projection and extending outwardly from the projection away from the web with the outer surface of said second projection terminating in a surface considerably smaller in area than that of the first projection, the steps comprising positioning and biasing the outer surface of the second projec-

tion into contact with the base to which the attachment member is to be secured, positioning a welding electrode of a condensor-discharge welding apparatus in contact with the opposite surface of the web from the side from which the projections extend and in alignment with the second projection, and applying a current impulse for melting the base in the region of its contact with the second projection and in its region juxtaposed to the first projection and also for melting the second projection and first projection for welding the areal surface of the first projection of the attachment member to the base.

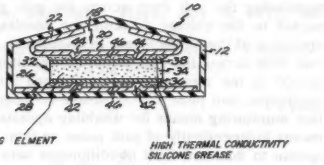


3,996,447

PTC RESISTANCE HEATER

Michael L. Bouffard, Pawtucket, R.I., and John L. Grant, Mansfield, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1974, Ser. No. 528,065
Int. Cl.² H05B 3/02; H01C 7/02
U.S. Cl. 219—541 6 Claims



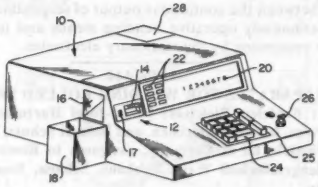
1. A self-regulating electrical heater device comprising a casing, a resistor element of disc-like configuration disposed within said casing, said resistor element having a layer of a ceramic material of selected thickness and of positive temperature coefficient of resistivity which displays a sharp increase in resistivity when heated to a selected temperature by directing electrical current through said ceramic layer for regulating the heated temperature of said element, said layer of ceramic material having flat surfaces on respective opposite sides thereof which are broad relative to said ceramic layer thickness and having metal layers on said broad flat surfaces providing electrical contact surfaces on said opposite sides of said ceramic layer, pair of electrically conducting metal terminals disposed within said casing adjacent said respective contact surfaces of said resistance element, a silicone material having a metallic particulate dispersed therein disposed to substantially fill the space between at least one of said terminals and the one contact surface of said element adjacent to said one terminal to provide improved heat-transfer to said one terminal from a selected area of said element contact srface, said one terminal having a plurality of protuberances in a selected pattern thereon extending through said silicone material into electrical engagement with selected spaced areas of said one contact surface, and means cooperating with said casing for resiliently biasing said one terminal to maintain said protuberances extending through said silicone material into said electrical engagement with said one terminal and for disposing the other of said contact surfaces in electrical engagement with the other of said terminals.

3,996,448

DATA COLLECTION SYSTEM

Jarl A. Anderson, Northboro; Kenneth J. Bate, Natick; Victor Blumenthal, Framingham; James E. King, Sudbury, all of Mass.; Eugene F. Kusekoski, Nashua, N.H., and Nunzio Napoleone, Worcester, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 10, 1975, Ser. No. 566,837
Int. Cl.² G06K 15/00, 7/08; G11B 21/02
U.S. Cl. 235—61.6 R 4 Claims



1. A data collection system comprising
a ticket carrying encoded information in at least one rotary track;
means for loading said ticket into said system;
means for shifting said ticket from its loading position into an operative position;
means, including a transducer with a rotary head coupled to a rotary transformer, for reading information from said ticket;
means for shifting said ticket out of said operative position;
means for automatically ejecting said ticket;
means for processing information read from said ticket for transmission to a storage medium in accordance with a stored program;
means for keying information into the processing means in accordance with a preselected function;
means for selecting functions;
means for shifting the ticket out of said operative position; and
means for automatically ejecting said ticket.

3,996,449

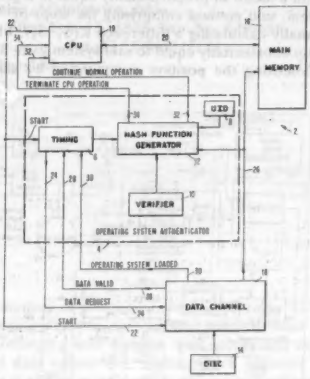
OPERATING SYSTEM AUTHENTICATOR

Clement Richard Attanasio, Peekskill, and Laszlo Antal Belady, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,410
Int. Cl.² G06K 5/00; H04Q 5/02
U.S. Cl. 235—61.7 R 8 Claims

1. A method of authenticating that a program being loaded into a computer is valid, said method comprising the steps of:
storing an identification code unique to said program;
generating an authenticating value as a function of said identification code and at least a given portion of the program being loaded; and

determining the authenticity of the program being loaded in response to comparing said authenticating value with a

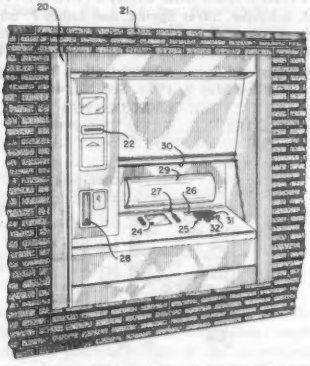


prestored verifier value which is a predetermined function of a valid program and said identification code.

3,996,450
SECRET NUMBER CHANGE ROUTINE

Diane P. Kerkhoff, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 31, 1975, Ser. No. 563,436
Int. Cl.² G06K 7/08
U.S. Cl. 235—61.7 B **12 Claims**



4. A method of changing the coded secret number recorded on a credit card, which method utilizes a program sequence in conjunction with a machine of the type that is activated by a credit card, the method comprising the steps of:

a. directing an authorization code to said machine authorizing a change in the secret number recorded on a credit card;

b. inserting a credit card into said machine;

c. entering the desired secret number of the machine keyboard;

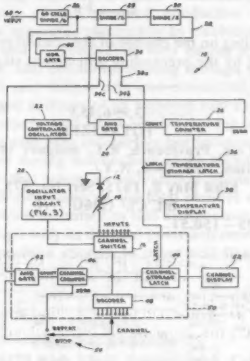
d. erasing the old secret number from the credit card and recording the keyboard secret number on the credit card; and

e. returning the credit card to the user.

3,996,451
SEMICONDUCTOR DIODE TEMPERATURE SENSING DEVICE

Daniel C. Harrington, Fridley; Gerald L. Ahmann, St. Paul, and John C. Fox, Coon Rapids, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 28, 1975, Ser. No. 626,430
Int. Cl.² G06M 3/08; G01K 7/00
U.S. Cl. 235—92 MT **5 Claims**



1. A semiconductor diode temperature sensing device comprising,

a semiconductor diode,

a first differential amplifier, for providing a regulated voltage for said diode, the positive input to said amplifier being connected to ground,

a load resistor connected to the negative input of said amplifier and adapted to be connected to a voltage source,

a variable resistance feedback network connected between the output of said amplifier and the negative input of said amplifier,

a second differential amplifier, the positive input of said amplifier being operatively connected with said diode,

a diode load resistor connected between the output of said first amplifier and the positive input of said second amplifier,

a resistance connected between the output of said first amplifier and the negative input of said second amplifier, and a feedback network connected between the negative input of said second amplifier and the output of said second amplifier.

3,996,452
METHOD FOR OPTIMIZING A CONTROLLED SYSTEM PARAMETER

Holger Schulze, and Hans Löffler, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

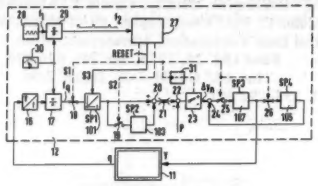
Filed Aug. 21, 1975, Ser. No. 606,428
Claims priority, application Germany, Aug. 22, 1974, 2440346
Int. Cl.² B02C 25/00; G05B 13/00
U.S. Cl. 235—150.1 **10 Claims**

1. A method for optimizing a controlled system parameter which is responsive to a regulated variable which is an input to the controlled system comprising:

a. measuring the controlled system parameter to be optimized; and

b. generating a regulated variable as an input to the controlled system by adding to the previous value of the regulated variable periodically successive adjustment

steps derived from the difference, with an alternating sign, between a constant component and a component



depending on the change of the control system parameter caused by the preceeding adjustment step.

3,996,453

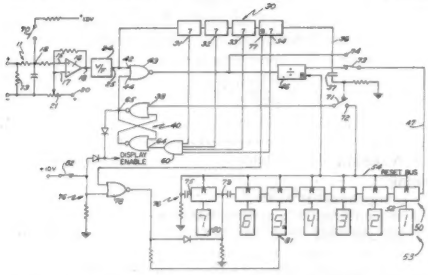
TOTALIZER

Pasco A. Coia, Providence, R.I., assignor to General Signal Corporation, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,781

Int. Cl.² G06G *7/18*

U.S. Cl. 235—150.51 **4 Claims**



1. A totalizer adapted to accept a process signal input and produce a totalized readout comprising first means for converting an input signal to a voltage signal proportional to the value of the input, second means converting said voltage signal to a series of pulses whose repetition rate is proportional to the signal input, a second multiple stage decade counter/divider responsive to the pulses, said counter/divider having decoded display outputs, a numerical display, said display coupled to the display outputs, means for introducing a scaling factor into the pulses, said means comprising a controllable gate connecting the second means to the second counter for passing a predetermined quantity of pulses over a chosen period, a first multiple stage counter with decoder terminals, a memory logic device, an AND gate coupled to the decoder terminals of the first counter, said AND gate also coupled to the memory device to reset the memory device which is coupled to the controllable gate to close the gate, and means to open the gate and reset the memory device after a full count by said first counter.

3,996,454

SERVOMECHANISM MONITOR FOR NUMERICALLY CONTROLLED MACHINE TOOLS

Stanley G. Froyd, San Marino, Calif., assignor to Actron Industries, Inc., Monrovia, Calif.

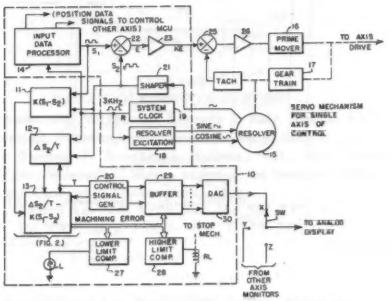
Filed Apr. 18, 1974, Ser. No. 461,957

Int. Cl.² G05B *23/02*

U.S. Cl. 235—151.11 **12 Claims**

1. A method for monitoring machining error along an axis of motion of a numerically controlled machining tool having a servomechanism for tool control, said servomechanism being responsive to an input position data signal, and a feedback position signal from a tool position transducer, for producing motion of said tool with a velocity proportional to the difference between said input position data signal and said feedback signal with a factor of proportionality equal to a gain factor of said system, said method comprising the steps of

continually calculating a difference $K(S_1-S_2)$, where K is a factor substantially equal to said system gain, S_1 is a value representing the position commanded by said position



data signal, and S_2 is a value representing the position of said tool indicated by said tool position transducer,

continually computing an average change, ΔS_2, per unit time, T, in the tool position along said axis, and

continually computing machining error as the difference between said average change per unit time and said difference, $K(S_1-S_2)$.

3,996,455

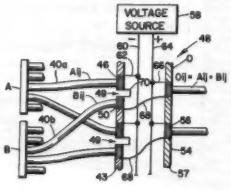
TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS AND COMPUTING DEVICES

David H. Schaefer, Silver Spring, and James P. Strong, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 8, 1974, Ser. No. 468,614

Int. Cl.² H03K *19/14*

U.S. Cl. 235—152 **63 Claims**



1. A radiant energy digital device comprising:

a two-dimensional input array of ordered digital radiant energy signal conduits;

a two-dimensional output array of ordered digital radiant energy signal conduits;

wherein the signal conduits of input and output arrays have positions in correspondence; and

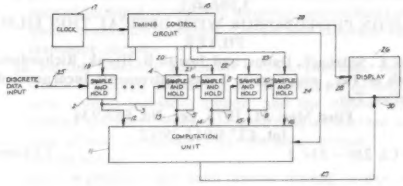
radiant energy interconnection means connected between said input and output conduit arrays and having a means for directing digital signals in the input conduits to the output conduits, said output conduits being offset in position from the input conduits by a predetermined amount.

3,996,456

RECURSIVE INTERPOLATION

Bradley R. Hoover, Hamilton, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 13, 1975, Ser. No. 549,466
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 49 Claims



32. The method of producing, from a plurality of successively occurring discrete data values, a continuous display accurately reflecting said discrete data values and including interpolated data values intermediate each adjacent pair of said discrete data values, said method comprising the steps of:

a. repetitively acquiring, in shifting progression, a predetermined number of consecutively occurring ones of said succession of discrete data values, each of said repetitive acquisitions defining a sample period; and

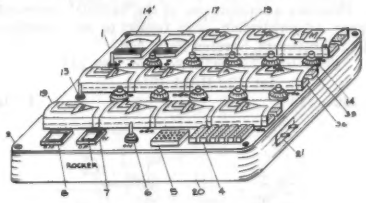
b. producing a trace on a display continuously interconnecting said plurality of discrete data values, said trace comprising a repetitive series of interpolated segments each produced during a respective one of said sample periods and continuously connecting in adjacently occurring pair of discrete data values in each of said respectively acquired predetermined number of consecutively occurring discrete data values.

3,996,457

ELECTRONIC ANALOG COMPUTERS

Edwin Z. Gabriel, 318-B South St., Eatontown, N.J. 07724

Filed Nov. 20, 1974, Ser. No. 525,511
Int. Cl.² G06G *7/06, 7/48*; G09B *23/02*
U.S. Cl. 235—184 16 Claims



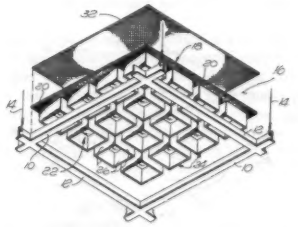
1. An analog computer structure for solution of differential equations which, in addition to active computing components, includes coefficient potentiometers of the incremental displacement type, wherein said panel includes coefficient potentiometers of the incremental displacement type, said potentiometer consisting of three or more cylindrically-shaped fixed portions mounted on a common hollow nonmetallic axle and each having an exterior rotatable sleeve held in position horizontally, faced with numerals from zero to ten, said fixed portions mounted side by side, so that even a blind person may be capable of rotating said sleeve and setting the desired attenuation value in appropriate digital numbers by feel, each said fixed portion having ten captured recessed rectangular-shaped resistors of equal magnitude and connected in series fashion, each of said resistors encased in hard insulation material and each said resistor having rigid electrical leads attached at each end, each said lead making electrical contact with a conductive bar and each said bar attached to a non-metallic hollow rod passing radially to the exterior surface of said axle; each said resistor held outward by a coiled tension spring located beneath each, each said spring supported at its lower end by the solid material of said fixed portion; said electrical contacts for a single one of said resistors made by two metallic captured balls and a riser beneath said sleeve, said riser pressing against one of said resistors and causing same to lose electrical contact with adjacent resistors, said two captured balls being connected to the zero and 10 ends of 10 other resistors serially connected around an adjacent cylindrical fixed portion, each of said balls electrically connected thereto via a set of spring wipers, each said set making electrical contact with one of two grooved conductive cylindrical flanged surfaces, separated electrically by insulation material, each said zero and 10 conductive bars having a conductor attached thereto, said conductor passing through said hollow rod and through said hollow axle and connected to each of two of said flanged surfaces of an adjacent said cylindrically-shaped fixed portion, said fixed portion having an exterior marker denoting said zero conductive bar location and exterior of said sleeve having indentations at the location of each said number so that when an indentation aligns with said marker, the numerical value of the total number of resistors connected in series is identified by said number and represents an attenuation digit with its decimal point determined by said fixed portion's position relative to other said fixed portions mounted on said common axle.

3,996,458

CEILING SYSTEM

Terry D. Jones, 4420 Park Alisal, Calabas Park, Calif. 91302, and John E. Stanley, 5421 Burning Tree Drive, La Canada, Calif. 91011

Continuation of Ser. No. 445,592, Feb. 25, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,502
Int. Cl.² E04B *5/62*
U.S. Cl. 240—9 R 10 Claims



1. The subcombination, adapted to be supported at its edges by T-bars comprising:

1. a flat horizontal rigid plastic sheet having a smooth surface and a generally uniform pattern of areas transmissive to light and areas opaque to light, the edges of which are adapted to rest on said T-bars,

2. a plurality of uniformly spaced-apart plastic cells having planar walls, said cells being open at their top and bottom ends and free of obstructions, said cells being adhesively joined to the smooth surface of said sheet and the walls thereof projecting perpendicularly downwardly therefrom, said adhesive joinder being by abutment of the top end of said cells to said sheet to form an adhesive line, said adhesive line being limited in area to the cross section of the cell walls, the bottom end of said cell being open and the smooth surface of said sheet being visible through said bottom end,

at least those areas of said sheet within the perimeter defined by each said cell being transmissive to visible light so that light can shine downwardly through said cells, and

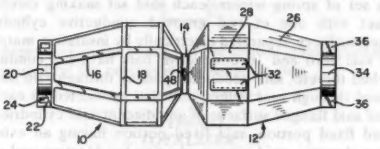
said opaque areas of said sheet extending between adjacent cells and including at least those areas of said sheet adapted to be supported by T-bars.

3,996,459

TROUBLE LIGHT GUARD AND REFLECTOR

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Filed Mar. 25, 1975, Ser. No. 561,858
Int. Cl.² F21V 15/02, 21/00
U.S. Cl. 240—54 A 4 Claims



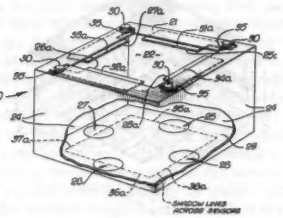
1. A trouble light guard and reflector comprising a molded plastic dielectric member having two half portions connected by an integral web of flexible plastic material at their top edges, one half portion comprising a plurality of spaced longitudinal and transverse bars forming a wide open mesh portion adapted to permit the passage of light, the other half portion constituting a reflector for the light, and means for locking the bottom ends of said half portions to each other around the light socket, said half portions each forming three angularly disposed panels arranged in a semicircle.

3,996,460

SOLAR TRACKING CONTROL SYSTEM USING SHADOW DETECTION

Peter D. Smith, 1912 Kathryn Court, Bakersfield, Calif. 93308

Filed Dec. 3, 1975, Ser. No. 637,143
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R 13 Claims



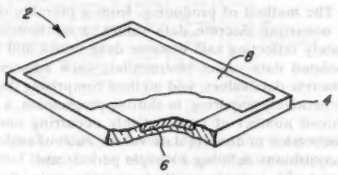
1. In a control system for radiation tracking apparatus,
a. a shadow box having a window,
b. four photo sensors located within the box to receive incident radiation passing through the window,
c. first and second of the sensors respectively having upper and lower locations to provide outputs controlling elevational tracking movement of said apparatus, and
d. third and fourth of the sensors respectively having left and right locations to provide outputs controlling azimuthal tracking movement of said apparatus,
e. said window having first and second adjusted edges which are located to variably cut-off direct incidence of radiation on the first and second sensors respectively in response to relative elevational rotation between the box and the direction of radiation transmission, thereby to alter the outputs of said first and second sensors, and said window having third and fourth adjusted edges which extend generally at right angles to said first and second edges to variably cut-off direct incidence of radiation on the third and fourth sensors respectively in response to relative azimuthal rotation between the box and the direction of radiation transmission, thereby to alter the outputs of the third and fourth sensors, the control system including means responsive to said altered outputs to control said tracking movement.

3,996,461

SILICON PHOTOSENSOR WITH OPTICAL THIN FILM FILTER

Frank C. Sulzbach, Dallas, and Joseph B. Horak, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1975, Ser. No. 563,934
Int. Cl.² H01J 39/12
U.S. Cl. 250—211 J 7 Claims



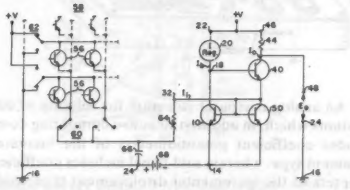
1. A photodetector comprising a semiconductor substrate having a photosensitive region therein and a multilayer thin film optical filter on a surface of said substrate covering said photosensitive region, said filter comprising a first thin film of dielectric having an index of refraction of about 2.0, a second thin film of dielectric on said first film having an index of refraction of about 2.35, a third thin film of dielectric on said second film having an index of refraction of less than about 1.5, and a plurality of additional thin films thereon, corresponding alternately to the index of said second and third thin films, respectively.

3,996,462

SOLID-STATE CURRENT TRANSFORMER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of David L. Farnsworth, Severna Park, Md.

Filed June 23, 1975, Ser. No. 589,233
Int. Cl.² H01J 39/12
U.S. Cl. 250—214 A 1 Claim



1. A solid-state television camera circuit comprising a matrix of solid-state photosensitive elements are directly switched to provide an unamplified serial output at first and second output terminals;
a common emitter transistor circuit including a transistor, the base and emitter of which comprise an amplifier input;
a capacitor coupled across said terminals;
a resistor connected between said first terminal and the base input of said common emitter transistor circuit, and said resistor comprising with said capacitor a signal filter

means for rolling off commutated video signal bandwidth and dampening feed-through switching spikes;

a diode connected transistor circuit, the base and collector of same being connected together to the base of said common emitter transistor circuit, and the emitter being connected to the emitter of said common emitter transistor circuit;

a forward emitter biasing source connected between said second terminal, a common terminal, and emitters of said diode connected transistor circuit and common emitter transistor circuit;

an emitter follower transistor circuit, the base input of which is directly connected to the collector of said common emitter transistor circuit, and the emitter of said emitter follower circuit being directly connected to the base of said common emitter transistor circuit;

a biasing source;

a load impedance and said reverse biasing source being connected in series between the collector of said emitter follower transistor circuit and said common terminal;

constant current biasing means for providing, separate from said amplifier input of said common emitter transistor circuit, collector, reverse, bias to said common emitter transistor circuit and base, forward, bias to said emitter follower transistor circuit, said constant current biasing means being connected between said direct connection between the base input of said emitter follower transistor circuit and the collector of said common emitter transistor and said biasing source; and

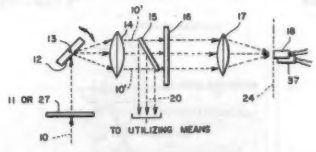
output coupling means for coupling a signal output from said load impedance.

3,996,463

METHOD AND APPARATUS FOR MONITORING THE RELATIVE POSITION OF A LIGHT BEAM AND A GRATING USING FRAUNHOFER DIFFRACTION EFFECTS

Donald Paul Jablonowski, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,821
Int. Cl.² H01J *39/12*
U.S. Cl. 250—237 G **28 Claims**



1. In a method of monitoring relative movement between an incident beam of substantially coherent light and a grating on which the beam is directed, wherein light from the beam passing through the grating is detected by a photodetector and the cycles in the photodetector output signal are counted, the improvement which comprises:

a. patterning the incident beam into a plurality of elements;

b. transforming the patterned beam into a Fraunhofer diffraction pattern in the plane of the grating, the grating diffracting the transformed beam into diffraction orders;

c. resolving the diffraction orders in an image plane;

d. spacing the elements in step (a) to cause the +1 diffraction order from one of the elements to coincide with the −1 diffraction order from another of the elements to form an interference image in the image plane; and

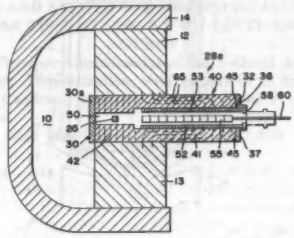
e. positioning the photodetector in the image plane to detect the interference image.

3,996,464

MASS SPECTROMETER WITH MAGNETIC POLE PIECES PROVIDING THE MAGNETIC FIELDS FOR BOTH THE MAGNETIC SECTOR AND AN ION-TYPE VACUUM PUMP

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Leonard M. Sieradski, Altadena; Charles E. Giffin, Pasadena, both of Calif., and Alfred O. Nier, St. Paul, Minn.

Filed Nov. 21, 1975, Ser. No. 634,205
Int. Cl.² H01J *39/34*
U.S. Cl. 250—289 **12 Claims**



1. A mass spectrometer comprising:

a magnetic yoke;

a pair of spaced apart magnets coupled to said yoke;

a housing including a non-magnetic hollow structure and a pair of spaced apart magnetic pole pieces, forming two opposite sides of said housing, said housing being located with respect to said magnets whereby portions of said pole pieces are in contact with said spaced apart magnets and together therewith and said yoke define a magnetic sector of said mass spectrometer, with the space between the portions of said magnetic pole pieces defining a gap region of said magnetic sector, said housing and portions of said pole pieces extending beyond said magnetic sector and forming and enclosure for ion-type vacuum pump means;

ion-type vacuum pump means located in said housing in the space between the portions of the pole pieces extending beyond said magnetic sector, and in direct communication with said gap region, with said pole pieces providing a magnetic field across the magnetic sector gap region and across said ion-type vacuum pump means;

first means including means coupled to a first end of said housing for providing a path of ions into said gap region; and

second means including means coupled to a second end of said housing for providing a path for ions exiting said gap region.

3,996,465

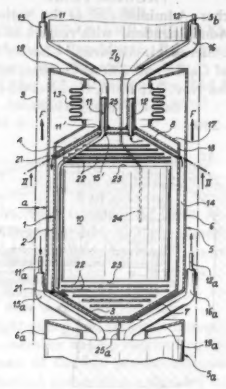
TEST RIG FOR SUBJECTING SPECIMENS TO HIGH TEMPERATURE BEHAVIOR TESTS

Jacques Beauchede, L'Etang-la-Ville, and Paul Breant, Asnieres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 30, 1975, Ser. No. 627,449
Claims priority, application France, Nov. 7, 1974, 74.36987
Int. Cl.² G21C *17/00*
U.S. Cl. 250—304 **10 Claims**

1. A test rig for subjecting specimens to high temperature behavior tests under intense gamma radiation, the complete rig being intended to be maintained within the high neutron flux zone of a nuclear reactor channel, said rig being of the type comprising two coaxial casings having cylindrical side walls, the inner casing being adapted to receive said specimens and to be connected to an inlet pipe and a return pipe for a specimen environment gas, the annular gap limited by the two

casings being intended to be connected to an inlet pipe and a return pipe for a gas having variable thermal conductivity, wherein the bottom and top walls of said casings are of convex frusto-conical shape, said frusto-conical walls being maintained together in pairs at a short distance which is as constant as possible, and wherein the top frusto-conical wall of the outer casing is connected by means of a thermal expansion bellows seal to the cylindrical side wall of said outer casing.

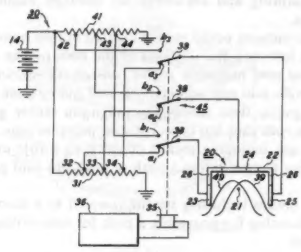


3,996,466

TRANSFER CORONA DEVICE WITH ADJUSTABLE SHIELD BIAS

Thomas G. Davis, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1975, Ser. No. 553,340
Int. Cl.² H01T *19/04*
U.S. Cl. 250—325 **10 Claims**



1. A corona device including a wire electrode at least partially surrounded by a shield, said shield comprising a plurality of conductive segments insulated from each other, biasing means for providing at least two sets of biasing potentials to said segments and switching means for coupling one of said sets to said segments.

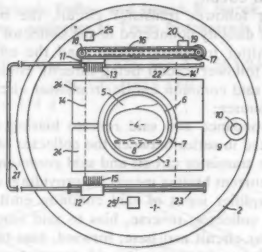
3,996,467

DATA ACQUISITION IN TOMOGRAPHY

Robert Justin Froggatt, Southall, and William Spencer Percival, London, both of England, assignors to EMI Limited, Hayes, England

Filed May 15, 1975, Ser. No. 577,625
Claims priority, application United Kingdom, May 15, 1974, 21528/74
Int. Cl.² G03B *41/16*
U.S. Cl. 250—366 **9 Claims**

1. An apparatus for examining a body by means of penetrating radiation such as X- or γ-radiation including source means arranged to irradiate a substantially planar region of the body, detector means responsive to said radiation and disposed to receive the radiation after passage through the body, means for scanning the source and detector means with respect to the body to irradiate the body along a plurality of sets of substantially parallel beam paths in the plane of said region, the paths of each set being spaced laterally from one another and means for constructing output signals, each from values of the intensity of radiation received along different paths of a set, weighted by respective factors, the weighting factors being chosen according to a predetermined function so that spatial frequency components of the output signals, resulting from variations in the absorption of the radiation in the direction of the lateral spacing, are limited to a predetermined spatial frequency band, and further including means arranged to provide signals, which are logarithms of said output signals, for processing to construct a representation of the distribution of absorption with position in the said planar region.

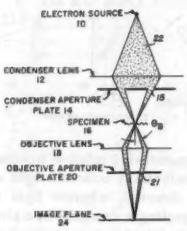


3,996,468

ELECTRON MICROSCOPE APERTURE SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Klaus Heinemann, Sunnyvale, Calif.

Continuation of Ser. No. 221,670, Jan. 28, 1972, abandoned. This application July 23, 1973, Ser. No. 381,848
Int. Cl.² H01J *37/04*
U.S. Cl. 250—396 **5 Claims**

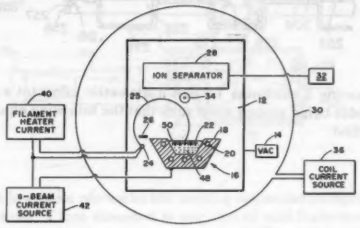


1. In an improved electron optical system of the type having an electron source for generating an electron stream, condenser means for focusing said electron stream onto a specimen, a condenser aperture for guiding the electron stream onto the specimen, and an objective lens for focusing said electron stream onto an image plane, wherein the improvement comprises an objective aperture plate having an annular aperture as the only opening therein for limiting the number of electrons which can intersect the said image plane to only that fraction which has passed the said objective lens in the same lens zone.

3,996,469
FLOATING CONVECTION BARRIER FOR EVAPORATION SOURCE

George Sargent Janes, Lincoln, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Jan. 6, 1975, Ser. No. 538,881
Int. Cl.² H01J 39/34
U.S. Cl. 250—423 P 14 Claims

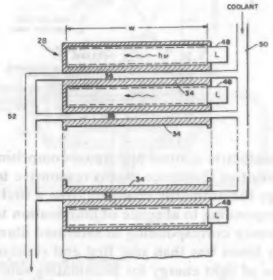


1. An isotope separator having a vapor source for producing an expanding uranium vapor flow and comprising:
a water cooled crucible container;
a melt within said water cooled crucible and including a matrix of a material having a density lower than uranium and a supply of uranium contained within said matrix;
means for applying an electron beam to the surface of said melt to produce liquefication and vaporization of a portion of the uranium contained within said matrix, said matrix inhibiting the flow of convection currents in the molten uranium thereby to improve vaporization efficiency;
means for producing isotopically selective photoionization of the expanding uranium vapor; and
means for separately collecting the ionized uranium particles in said expanding vapor.

3,996,470
LASER ALTERATION OF ACCOMMODATION COEFFICIENT FOR ISOTOPE SEPARATION

James C. Keck, Andover, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Oct. 15, 1974, Ser. No. 514,303
Int. Cl.² H01J 39/34
U.S. Cl. 250—423 P 40 Claims

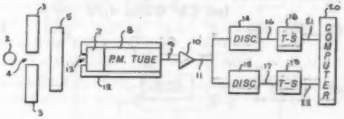


1. A method for producing isotopic separation among molecules having plural isotopes of an atom, the method comprising the steps of:
establishing a flowing environment of the molecules having an atom thereof present in several isotope types;
inducing isotopically selective vibrational excitation of the molecules of said flowing environment by exposing said molecules to electromagnetic radiation so as to produce molecular vibration of molecules having an atom of a predetermined isotope type without correspondingly inducing vibration of molecules having an atom of another isotope type;
physically reacting the flowing molecules with at least one body to alter the flow thereof as a function of vibrational excitation of the molecules so that the concentration of said predetermined isotope type is increased in at least one region of the flowing environment, thereby effecting isotopic separation.

3,996,471
METHOD AND SYSTEM FOR IN VIVO MEASUREMENT OF BONE TISSUE USING A TWO LEVEL ENERGY SOURCE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John R. Cameron, Madison, Wis., and Philip F. Judy, Boston, Mass.

Filed Mar. 11, 1975, Ser. No. 557,430
Int. Cl.² G01N 21/34
U.S. Cl. 250—444 19 Claims



9. Apparatus for determining the bone mineral content of a living specimen portion of a human, comprising
frame means having spaced apart upper and lower arm portions,
table means interconnected with and horizontally supported by said lower arm portion of said bracket means and further having a collimating aperture,
a polyenergetic radiation source disposed below said table means and adjacent said collimating aperture therein for producing a beam of radiations of predetermined energies and intensities projecting upward from said collimating aperture,
a radiation detector adjustably interconnected with and vertically supported by said upper arm portion of said bracket means for receiving said beam of radiations,
holder means fixedly interconnectable with said table means for establishing said specimen in said radiation beam according to a preselected geometry, and
shielding means interposed about and having an aperture of a preselected size for exposing said detector means to substantially only non-attenuated radiations in said beam.

3,996,472
THERMOLUMINESCENT MATERIALS UTILIZING RARE EARTH OXYHALIDES ACTIVATED WITH TERBIUM

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

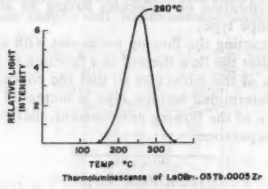
Filed Apr. 7, 1975, Ser. No. 565,642
Int. Cl.² H05B 33/00
U.S. Cl. 250—484 5 Claims

1. A thermoluminescent material comprising crystals of a material essentially according to the formula:

$$M_{1-w}OX:Tb_wA_y$$

wherein
M is an element selected from the group consisting of La, Gd and Y;
X is an element selected from the group consisting of Cl and Br;
A is an element selected from a group consisting of Zr and Hf;

w is from 0.005 to 0.30 mole per mole of the selected oxyhalide;



and y is from zero to 0.01 mole per mole of the selected oxyhalide.

3,996,473

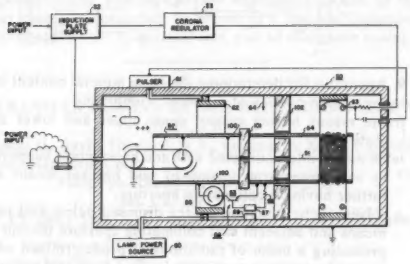
PULSED NEUTRON GENERATOR USING SHUNT BETWEEN ANODE AND CATHODE

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 468,111, May 8, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,097

Int. Cl.² G21G *4/02*

U.S. Cl. 250—501 **14 Claims**



1. A pulsed neutron source, comprising:

an ion beam accelerator having an anode and a cathode and direct current shunting circuitry between said anode and said cathode for shunting the accelerating gap voltage stabilizing corona current therebetween, said accelerator also having a static atmosphere substantially composed of a heavy isotope of hydrogen, means to ionize said atmosphere and a target containing a heavy isotope of hydrogen arranged to receive atmosphere ions; and

pulsing means interconnected with said ionization means to periodically ionize said atmosphere.

3,996,474

CORONA GENERATOR APPARATUS

Frank E. Lowther, Severna Park, Md., assignor to Purification Sciences, Inc., Geneva, N.Y.

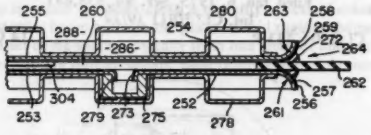
Division of Ser. No. 379,846, July 16, 1973, Pat. No. 3,954,586, which is a continuation of Ser. No. 141,148, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 612,751, Jan. 4, 1967, abandoned, said Ser. No. 141,148, is a continuation-in-part of Ser. No. 830,248, June 4, 1969, Pat. No. 3,798,457. This application Oct. 16, 1975, Ser. No. 623,033

The portion of the term of this patent subsequent to May 4, 1991, has been disclaimed.

Int. Cl.² C01B *13/11*

U.S. Cl. 250—532 **2 Claims**

1. A corona generating device for producing ozone comprising a pair of parallel, spaced-apart electrodes connected to a voltage source Vo, a layer of thin hard dielectric material positioned between said electrodes, an air gap Ta of uniform width between said layer and the other of said electrodes, said



layer having a thickness Td and a dielectric constant ϵ, said electrodes being spaced apart such that the following equation is satisfied:

$$Ta = \frac{Vo}{200} - \frac{Td}{2\epsilon}$$

where

Ta — air gap in mils

Vo — applied peak voltage in volts

Td — dielectric thickness in mils

ϵ — dielectric constant

3,996,475

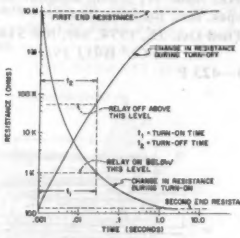
PHOTOELECTRIC CONTROLLING

Edward T. Rodriguez, 2 Linden St., Reading, Mass. 01867

Filed July 28, 1975, Ser. No. 599,710

Int. Cl.² G02B *27/00*; H03K *3/42*

U.S. Cl. 250—551 **13 Claims**



1. Photoelectric control apparatus comprising,

photosensitive resistance means responsive to incident light energy for ordinarily changing from a first end resistance corresponding to absence of illumination to a second end resistance corresponding to saturated illumination that is many times less than said first end resistance,

a source of light energy for illuminating said photosensitive resistance means,

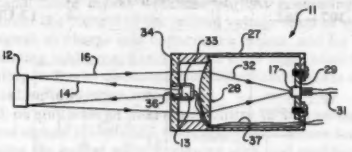
and means for controlling the light energy provided by said source to a value which causes said photosensitive resistance means to assume a resistance value that is always significantly above said second end resistance and much lower than said first end resistance so that the turn-off time of said photosensitive resistance means is of the order of the turn-on time thereof.

3,996,476

LOW NOISE PHOTOELECTRIC DETECTOR APPARATUS

Anthony Ross Lazzara, Portola Valley, Calif., assignor to Scientific Technology Incorporated, Mountain View, Calif.

Filed Sept. 10, 1975, Ser. No. 611,871
Int. Cl.² G01N 21/32
U.S. Cl. 250—563 7 Claims



1. A low noise photoelectric sensing apparatus comprising a framework, a lens mounted in one end of said framework for focusing light impinging thereupon at a focal point located on the rear side of said lens on a central axis passing therethrough, said lens having a front side exposed to the exterior of said framework and having a central hole therein,

a photodetector mounted in said framework on said central axis positioned toward the rear of said lens for receiving the focused light and providing an output signal related thereto,

a light source mounted on said central axis positioned toward the front of said lens for emitting light away from said lens,

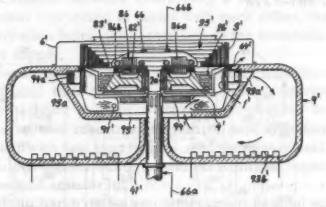
an opaque collar formed to fit in said central hole for shielding said lens from said emitted light to reduce noise in said output signal resulting from spurious light from said light source impinging on said photodetector, said lens serving to receive emitted light only after reflection from objects in front of said lens, whereby said output signal provides a low noise indication thereof.

3,996,477

THERMAL PRIME MOVER

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Filed May 15, 1974, Ser. No. 470,060
Claims priority, application Austria, June 15, 1970, 5369/70; June 15, 1970, 5370/70
Int. Cl.² H02K 7/18
U.S. Cl. 290—52 10 Claims



1. A power plant comprising:

a supporting frame;

an engine adapted to be driven by vapors of a vaporizable working fluid, said engine having a sealed housing and two relatively movable members mounted in said housing for rotation in opposite directions relative to said housing, solely by the pressure of the expanding working fluid, with mutually balanced torques;

heat-exchanger means connected with one of said members for rotation therewith, said heat-exchanger means including an evaporator upstream of said engine and a condenser downstream of said engine in a relatively hot and a relatively cold environment, respectively;

transmission means coupling the other of said members to a load to be driven; and

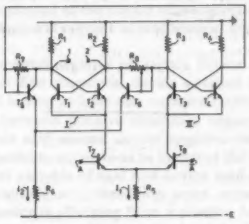
conduit means including said housing for conducting said working fluid in a closed circuit through said engine and said heat-exchanger means for thermal interaction with said environments in said evaporator and said condenser.

3,996,478

FREQUENCY DIVIDER FOR HIGH FREQUENCIES

Wolfdietrich Georg Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,721
Claims priority, application Netherlands, May 27, 1974, 7407057
Int. Cl.² H03K 23/08
U.S. Cl. 307—225 R 1 Claim



1. A frequency divider comprising a first and a second bistable circuit, each comprising two-cross-coupled transistors,

first and second gating transistors connecting said cross-coupled transistors of said first and second bistable circuits respectively to a point of constant potential;

the base of said first gating transistor being connected to a first signal input, and the base of said second gating transistor being connected to a second signal input inverted relative to said first signal input;

said first bistable circuit including a pair of auxiliary transistors, connecting the collector of each of said transistors of said first bistable circuit by means of collector-base path to a respective collector of one of said transistors of said second bistable circuit, the emitters of said auxiliary transistors being connected to a point of constant potential; and

a coupling resistor having a tap, connected between the collector and base of each of the auxiliary transistors, said tap being connected to the base of said auxiliary transistor.

3,996,479

COMPARATOR/BISTABLE CIRCUIT

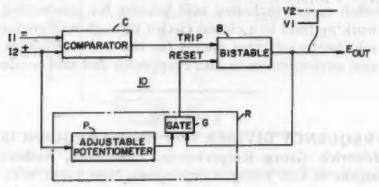
Johannes J. Schmitz, Catonsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 3, 1975, Ser. No. 593,084
Int. Cl.² H03K 5/20
U.S. Cl. 307—235 F 8 Claims

1. The combination of,

a comparator circuit means for comparing first and second input signals and generating a trip signal at an output in response to a predetermined relationship between said input signal, a bistable circuit means having a trip and reset state and an input connected to the output of said comparator circuit means, said trip signal establishing said bistable circuiting trip state, and a reset circuit means having an input and an output, one of said input signals to said comparator circuit means being supplied to the input

of said reset circuit means, the output of said reset circuit means being coupled to the input of said bistable circuit means, said reset circuit means responding to the trip



state of bistable circuit means by supplying a reset signal to said bistable circuit means which is a predetermined portion of said input signal supplied to said reset circuit means.

3,996,480

SAMPLE AND HOLD-CIRCUIT ARRANGEMENT FOR AN ELECTRICAL MOTOR SIMULATOR OF AN ELECTRONIC MOTOR PROTECTION RELAY

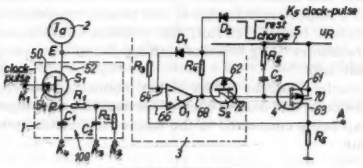
Michael Hentschel, Hannover, Germany, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Sept. 30, 1975, Ser. No. 618,211

Claims priority, application Switzerland, Oct. 1, 1974, 13219/74

Int. Cl.² G11C 27/02

U.S. Cl. 307—235 C **11 Claims**



1. A sample and hold-circuit arrangement for an electric motor simulator of an electronic motor protection relay, comprising means defining a motor simulator, a charging current source in circuit with said motor simulator, a main switch controlled via clock pulses for charging the motor simulator from the charging current source with clocked current, said current having charging and rest cycles, a sample and hold-amplifier and a storage capacitor and an electronic switching device connected in circuit via the main switch to the motor simulator, the electronic switching device being controlled by the clock pulses, the sample and hold-amplifier and the storage capacitor being electrically connected during the charging cycles to the motor simulator for recharging the storage capacitor to the charging voltage of the motor simulator and in the rest cycles being electrically disconnected from the motor simulator for the sample and hold-amplifier to be triggerable by the charging voltage of the recharged storage capacitor.

3,996,481

FET LOAD GATE COMPENSATOR

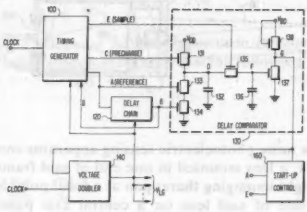
William M. Chu, and James M. Lee, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,133

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H03K 1/12

U.S. Cl. 307—262 **12 Claims**



1. An FET load gate compensator for regulating circuit delay and power dissipation of FET integrated circuits, comprising:

timing generator means adapted to receive an external clock for generating a time reference signal,

delay sensor means in an FET integrated circuit chip for simulating the circuit delay of an operational circuit in the FET integrated circuit chip, said delay sensor means producing a signal representing said circuit delay,

delay comparator means connected to receive said time reference signal and said circuit delay signal for producing a control output signal which varies according to the equality or inequality of the time reference signal and the circuit delay signal, and

load gate voltage generating means connected to supply a load gate voltage to the FET integrated circuit chip and responsive to said control output signal to vary said load gate voltage to cause said circuit delay signal to be equal to said time reference signal.

3,996,482

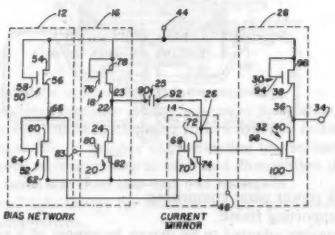
ONE SHOT MULTIVIBRATOR CIRCUIT

George C. Lockwood, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1975, Ser. No. 575,912

Int. Cl.² H03K 3/284, 3/353, 17/60, 1/02

U.S. Cl. 307—273 **9 Claims**



1. A one shot multivibrator circuit of the type operating with a voltage source having first and second voltage levels and the first voltage level is more negative than the second voltage level, and an input voltage waveform having a first and second voltage level and the first voltage level is more negative than the second voltage waveform for generating an out-

put pulse having a predetermined pulse width, said one shot multivibrator circuit comprising,

capacitance means for providing enabling and disabling voltage control signals,

FET current generating means connected between said capacitance means and said second voltage level for providing a constant current to charge said capacitance means,

FET input inverter means for switchably connecting said capacitance means with said current generating means under the control of the second voltage level of the input signal, to charge said capacitance means, and for disconnecting said capacitance means from said current generating means to discharge said capacitance means through said input inverter means, and

FET output inverter means responsive to said voltage control signals provided by said capacitance means for generating the output pulse beginning with said enabling signal and ending with said disabling signal.

3,996,483

MULTI-STATE SEMICONDUCTOR TACHOMETER CIRCUIT

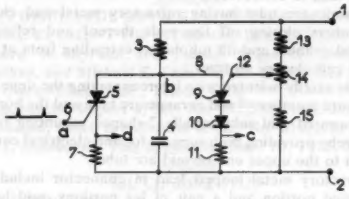
Claude Lombard, Le Chesnay, France, assignor to Regie Nationale des Usines Renault, France

Filed Apr. 11, 1975, Ser. No. 567,204

Claims priority, application France, Apr. 16, 1974, 74.13179

Int. Cl.² H03K 17/28, 17/56

U.S. Cl. 307—294 **5 Claims**



1. A tachometer circuit which receives a repetitive pulse input signal and provides two different output signals, powered by a D.C. power supply, and comprising:

a time-constant network comprising a first resistor and a capacitor connected in series with each other, the series combination being connected across the terminals of said power supply;

a first discharge path connected in parallel with the capacitor of said time-constant network and comprising the anode-cathode path of a thyristor connected in series with a second resistor, the gate of said thyristor being supplied with said input signal, and the first of said different output signals being outputted from the terminals of said second resistor;

a second discharge path also connected in parallel with said capacitor and comprising the anode-cathode path of a unijunction transistor (UJT) in series with a diode and a third resistor, the control electrode of said UJT being connected to a variable voltage dividing resistor circuit which is in turn connected across the terminals of said power supply, and the second of said output signals being outputted from the terminals of said third resistor,

said first resistor having a resistance value which is sufficient for keeping said UJT fired when said thyristor becomes extinguished.

3,996,484

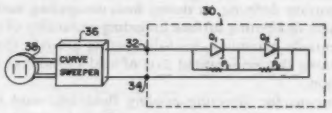
INTERACTIVE NEGATIVE RESISTANCE MULTIPLE-STABLE STATE DEVICE

George Abraham, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,820

Int. Cl.² H03K 3/31

U.S. Cl. 307—322 **11 Claims**



1. A composite multistate device comprising:

a first elemental negative resistance device having at least one negative resistance region occurring on a load line operating between positive resistance regions, when the load line is plotted as the circuit characteristic on a graph having voltage and current as independent and dependent variables;

a second elemental negative resistance device of the same type as said first elemental device coupled to said first device and having at least one negative resistance region occurring between positive resistance regions, and further wherein said second device negative resistance region is adjusted to occur so as to intersect the value of the independent variable of said first device load-line operating characteristic at a transition point occurring when said first device is changing from a positive to a negative resistance region when the magnitude of the independent variable is increasing and further wherein said second device negative resistance region occurs so that said intersection is at a value more negative than the value of the dependent variable at said transition point but further wherein said second device negative resistance region occurs so that said intersection is at a value less negative than a second intersection, if any, of said value of said independent variable at said transition point with said second positive resistance region of said first device,

whereby said composite multistate device will exhibit an additional stable state arising from stable operation in said negative resistance region of said second device interactively operating in the negative resistance region of said first device.

3,996,485

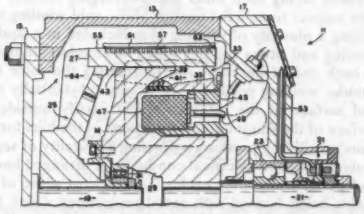
ELECTROMAGNETIC COUPLING AND COOLING SYSTEM THEREFOR

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 484,210, June 28, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,697

Int. Cl.² H02K 49/04

U.S. Cl. 310—103 **19 Claims**



1. An electromagnetic coupling comprising:

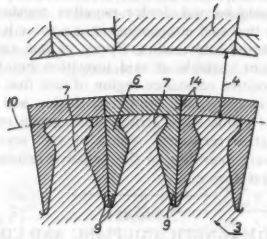
a. a housing;
b. a rotor member disposed in said housing;
c. inductor drum means disposed in said housing and rotatable relative to said rotor member;
d. coil means for electromagnetically coupling said rotor member and said inductor drum means;
e. said inductor drum means including a generally cylindrical drum portion having a substantially uniform magnetic reluctance in a direction generally parallel to the longitudinal axis of said cylindrical drum portion, said drum portion defining an outer, heat-dissipating surface, said-heat dissipating surface including a plurality of circumferentially extending, heat-dissipating grooves spaced apart along the longitudinal axis of said cylindrical drum portion;
f. means for directing cooling fluid into said housing to dissipate heat generated in said inductor drum means; and
g. a plurality of fluid-directing means attached to said outer, heat-dissipating surface of said inductor drum means for rotation therewith, said fluid directing means directing said cooling fluid inwardly into said heat-dissipating grooves to cool said inductor drug means.

3,996,486

SYNCHRONOUS MACHINE WITH A RATED POWER OF AT LEAST 1 MVA

Kristian Dahl Madsen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 4, 1975, Ser. No. 610,432
Claims priority, application Sweden, Sept. 6, 1974, 74112707
Int. Cl.² H02K *3/06*
U.S. Cl. 310—211 **7 Claims**



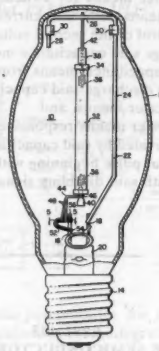
1. Asynchronous machine with a rated power of at least 1 MVA, comprising a laminated stator core (1) which supports a multiphase AC winding (2) and a rotor (3) surrounded by the stator core and formed with winding slots running axially along the entire rotor core, the length of the active rotor core being substantially greater than the length of the laminated stator core, each of said winding slots being provided with wall portions facing each other and converging radially outwards with respect to an axial central plane, said winding slots containing a plurality of winding bars included in a squirrel-cage winding and fitting the slot walls, an annular winding portion at each end of the rotor short-circuiting the rotor bars, said annular winding portion lying axially substantially inside the end surface of the rotor core and axially outside the end surface of the stator core, the portions of the bars forming said annular winding portion comprising a plurality of segments of material of good electrical conductivity arranged immediately and peripherally after each other, at least some of said segments being formed with radial projections which fill up the winding slots running along said annular winding part, at least 20% of the total cross-section of the segments being located radially outside the air gap surface (10) of the rotor core.

3,996,487

CERAMIC DISCHARGE LAMP WITH REDUCED HEAT DRAIN

Frederick W. Hoeh, Livingston, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 14, 1975, Ser. No. 577,516
Int. Cl.² H01J *61/30, 61/52*
U.S. Cl. 313—25 **6 Claims**



1. An arc discharge lamp of the ceramic arc tube type comprising:
a lamp base,
an outer envelope sealed to said base,
a pair of lead in conductors electrically connected to said base and extending into said outer envelope,
a substantially 7-shaped mounting frame secured to one of said lead in conductors,
a ceramic arc tube having refractory metal end closure members closing off the ends thereof and refractory metal exhaust and fill tubulation extending from at least one end closure member,
a single axially oriented wire interconnecting the upper end closure member of said ceramic arc tube and the horizontal arm of said substantially 7-shaped mounting frame, thereby providing both support for and electrical connection to the upper end of said arc tube,
a refractory metal looped lead in connector including a looped portion and a pair of leg portions, said looped portion surrounding said refractory metal exhaust and fill tubulation and brazed thereto; and
a flexible lead wire connected at one end to said other of said lead in conductors and at its other end to the ends of the said leg portions of said looped lead in connector, one of said flexible lead wire and said pair of leg portions of said looped lead in connector surrounding said other lead in conductor to thereby substantially restrict lateral movement of said arc tube with respect to said outer envelope while permitting substantially free axial movement of one end of said arc tube to thereby accommodate expansion of said arc tube during operation of said lamp.

3,996,488

GETTER DEVICE WITH DEFLECTOR

Mario Zucchinelli, Milan, Italy, assignor to Saes Getters S.p.A., Milan, Italy

Filed July 18, 1975, Ser. No. 597,158
Claims priority, application Italy, July 19, 1974, 25392/74
Int. Cl.² F04B *37/02;* **F04F** *11/00*
U.S. Cl. 313—174 **4 Claims**

1. A getter device for releasing barium while mounted in a cathode ray tube in the antenna position, said device comprising:

A. an annular ring container of U-shaped cross section

having an outer wall, an inner wall and a bottom wall joining said outer wall to said inner wall and

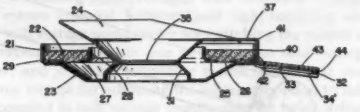
B. a barium releasing material within said annular ring and

C. a support tab having at least one substantially flat surface, attached to said annular ring and extending radially outwards beyond the outer wall of said annular ring and

D. a deflector comprising

a. a central depression,

b. a conical segment positioned around at least a portion of the central depression,



c. a radially extending segment attached to the central depression and the conical segment,

d. an axial locating element attached to the radially extending segment said axial locating element contacting said outer wall of said annular ring,

e. a radial U-shaped cross section locating element attached to the axial locating element and substantially co-extensive with and conforming to the surface of said support tab.

3,996,489

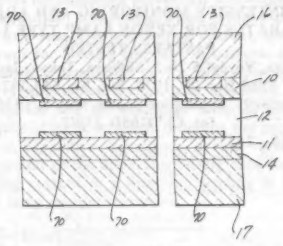
GAS DISCHARGE DEVICE INCLUDING TRANSITION METAL ELEMENT ON INTERNAL DIELECTRIC LAYER

Bernard W. Byrum, Jr., Toledo; Roger E. Ernsthausen, Luckey, and Michael E. Fein, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 293,555, Sept. 29, 1972, abandoned, which is a division of Ser. No. 210,093, Dec. 20, 1971, abandoned. This application Nov. 10, 1975, Ser. No. 630,586

Int. Cl.² H01J *61/35*

U.S. Cl. 313—188 **6 Claims**



1. In a gas discharge device containing at least two electrodes which define a gas discharge site, at least one of the electrodes being insulated from the gas by a dielectric member, the improvement wherein at least one dielectric member contains at least one conductive transition metal selected from the group consisting of V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Pd, and Pt, said transition metal being located on the gas-contacting surface of the dielectric member at each gas discharge site, the transition metal at each gas discharge site being physically isolated from the transition metal located at any other gas discharge site.

3,996,490

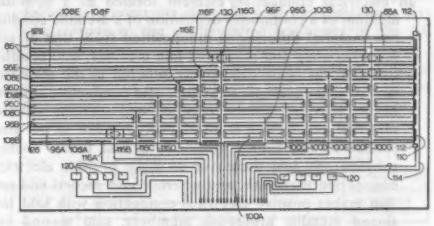
BUTTABLE FLAT PANEL DISPLAY MODULE

Donald E. Miller, Asbury, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 6, 1975, Ser. No. 584,549

Int. Cl.² H01J *61/06*

U.S. Cl. 313—217 **2 Claims**



1. A display panel comprising

a gas-filled envelope including a base plate and a face plate hermetically sealed together with a gas-filled space between them,

said envelope having a long axis and a short axis,

a plurality of parallel strip-like cathode electrodes on said base plate and oriented parallel to said short axis of said envelope,

said cathode electrodes being connected to first contact pads at an edge of said base plate,

a plurality of display anode electrodes and scan anode electrodes disposed on the lower surface of said face plate and oriented transverse to said cathode electrodes and parallel to said long axis of said envelope,

a transverse lead extending from each display anode and each scan anode to a second contact pad at the edge of said face plate which overlays said edge of said base plate,

said transverse leads being disposed on the bottom surface of said face plate and a plurality of said transverse leads passing through breaks in said display anodes and scan anodes, there being connecting bridges across said breaks and insulated from said transverse leads.

3,996,491

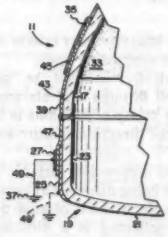
EXTERNAL CONNECTIVE MEANS FOR A CATHODE RAY TUBE

J. Frederick Larson, Seneca Falls, and Harry R. Swank, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 500,500, Aug. 26, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,782

Int. Cl.² H01J *29/00*, *31/00*

U.S. Cl. 313—479 **2 Claims**



1. An improvement in a cathode ray tube whereof the glass envelopic structure includes a viewing panel having a sidewall portion with a tensioned metallic band-like fracture-protective member peripherally positioned therearound and an inte-

grally related funnel portion having a skirt-like areal carbonaceous electrical conductive coating exteriorly disposed thereon in a manner spatially separated from said band-like protective member, said improvement being electrical connective means for inter-connecting said separated conductive coating and fracture-protective areas on the exterior of said tube, said interconnective means comprising:

an electrical conductive element formed as a strip-like medium of a continuous deposition of a metallic conductive material differing in composition from that of said funnel coating and said band-like member, said conductive element being extensively adhered to the glass surface of said envelopic structure, said conductive element having first and second opposed end sections whereof said first end section is interfacially bonded to the glass surface of said funnel portion with said funnel coating subsequently laid thereover to make positive electrical connection therewith, and whereof said second end section makes positive electrical connection with said tensioned metallic protective members; said second end section of said conductive element being interfacially bonded to that portion of said panel sidewall adjacent said tensioned protective member, the terminal portion of said second end section being oriented in overlay relationship relative to said fracture-protective member; and

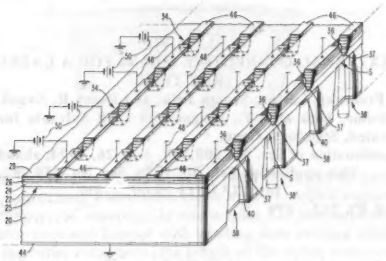
at least one electrical connective element affixed to said protective member to facilitate the consummation of an external operational electrical connection for said tube without disturbing said conductive element or the funnel coating associated therewith.

3,996,492

TWO-DIMENSIONAL INTEGRATED INJECTION LASER ARRAY

James Cleary McGroddy, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1975, Ser. No. 581,454
Int. Cl.² H01L *33/00*
U.S. Cl. 313—500 **5 Claims**



1. A folded cavity injection laser system comprising an array of p-n junctions in a supporting body,

electrodes electrically coupled to said p-n junctions whereby current through said electrodes produces light emission across said p-n junctions in a plane that is perpendicular to the direction of current flow through said junctions,

chemically etched mirror-like surfaces on said body, said etched surfaces being disposed at opposite ends of and at a 45 degree angle to each of said p-n junction so that lasing light is reflected in a direction parallel to said current direction in a p-n junction,

a totally reflecting thin film mirror beneath one of said pair of etched surfaces, and

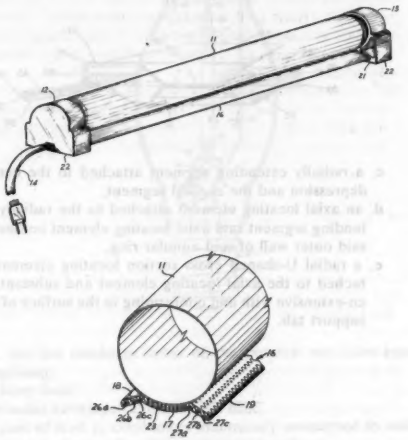
a partially transmissive mirror beneath the other of said pair of etched surfaces.

3,996,493

FLUORESCENT LAMP UNIT HAVING BALLAST RESISTOR

John M. Davenport, Euclid, and Elmer G. Fridrich, Cleveland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed July 28, 1975, Ser. No. 599,522
Int. Cl.² H01J *61/56*
U.S. Cl. 315—58 **18 Claims**



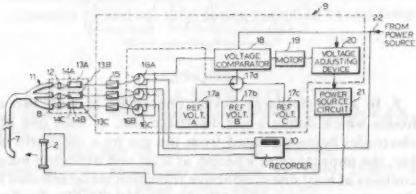
1. An integral self-contained gas discharge lamp unit comprising an elongated gas discharge lamp, a housing member positioned against and alongside said lamp and comprising a wing portion extending away from said lamp along the length thereof, and an elongated ballast resistor positioned embedded in said wing portion along the length thereof and connected electrically to ballast said lamp when operating, whereby heat generated in said ballast resistor when the lamp is operating will be dissipated from said wing portion into surrounding space.

3,996,494

LIGHT INTENSITY MONITORING AND ADJUSTING APPARATUS FOR XENON LAMP TYPE LIGHT FASTNESS TESTER

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,297
Claims priority, application Japan, May 1, 1975, 50-58384
Int. Cl.² G05D *25/02*
U.S. Cl. 315—151 **7 Claims**



1. A light intensity monitoring and adjusting apparatus for a light-fastness testing apparatus having a xenon lamp and a power source circuit for supplying power to said lamp, said monitoring and adjusting device comprising a light guide

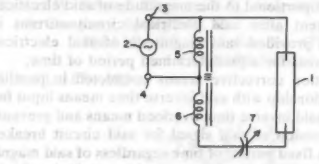
having a plurality of bundles of optical fibers therein and having one end directed toward the xenon lamp for picking up the light emitted therefrom, a light-receiving means to which the other ends of said bundle of optical fibers is connected and including a plurality of light-receiving elements corresponding in number to the number of bundles of optical fibers, and each being for receiving light of a spectrum different from the spectrum of light receiving by the other light-receiving elements and producing an electrical signal corresponding to the intensity of the light in said spectrum, a reference voltage source means, a voltage comparator coupled to said source means for comparing input voltages with reference voltage, switching means coupled between said light-receiving elements and said voltage comparator for switching the output of said light-receiving elements one at a time to said voltage comparator, and a voltage adjusting means coupled to said power source circuit for adjusting the voltage supplied to said lamp and coupled to said voltage comparator for being driven by the output thereof to change the voltage supplied to said lamp to bring the intensity of the light produced by said lamp in said spectrum to a value corresponding to the light intensity value represented by said reference voltage, whereby the intensity of light in a spectrum emitted by the lamp can be kept constant for testing specimens for light-fastness under constant conditions.

3,996,495

HIGH EFFICIENCY BALLAST SYSTEM FOR ELECTRIC DISCHARGE LAMPS

Stephen Herman, Monsey, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed July 25, 1975, Ser. No. 598,921
Int. Cl.² H05B *41/23*
U.S. Cl. 315—244 **11 Claims**



1. Apparatus for operating an electric discharge lamp with an alternating current comprising, a pair of input terminals for connection to a source of alternating current, inductive impedance means for limiting the flow of current, a nonlinear variable capacitive impedance device, and means connecting said inductive impedance means, said nonlinear capacitive impedance device and the discharge lamp in series circuit across said pair of input terminals whereby the impedance of the nonlinear capacitive impedance device varies with an electric parameter of the apparatus during each half cycle of the alternating current in a direction tending to produce a square-wave lamp current waveform.

3,996,496

GROUND INTEGRITY MONITOR FOR ELECTRICAL APPARATUS

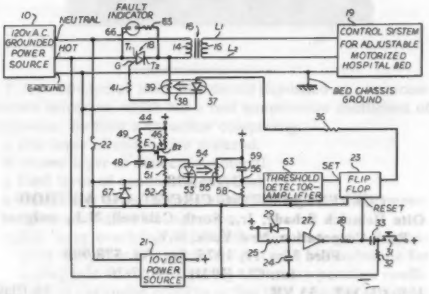
Joseph A. Volk, Jr., Florissant, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1974, Ser. No. 526,983
Int. Cl.² H02H *3/00*
U.S. Cl. 317—18 B **1 Claim**

1. A ground integrity monitor for electrical apparatus wherein a single phase, three-wire grounded AC power source having hot, neutral and ground terminals is coupled to the electrical apparatus for applying AC operating voltage thereto, wherein both the neutral and ground terminals are ordinarily connected to earth ground, and wherein a conductive chassis of the electrical apparatus is connected to the ground terminal, comprising:

a pulse signal generator including a unijunction oscillator having a unijunction transistor whose base-one is connected to the ground terminal through, in the order named, first and second series resistors, said generator producing, across said resistors, sharp narrow pulses periodically recurring at a pulse repetition frequency very low relative to the commutating frequency of the AC power source;

means for connecting the neutral/ground circuit in shunt with said second resistor to apply said pulses between the neutral and groud terminals of the AC power source;



control signal producing means responsive to the pulsing of the neutral/ground circuit for producing a control signal effectively representing the resistance between the neutral and ground terminals,

said control signal producing means including a light emitting diode photo coupler whose light emitting diode is connected in shunt with said first resistor and flashes when the resistance in the neutral/ground circuit is below a predetermined threshold level, thereby causing the photo resistor of said coupler to exhibit a relatively low resistance, the amplitude of said control signal being determined by the resistance of said photo resistor;

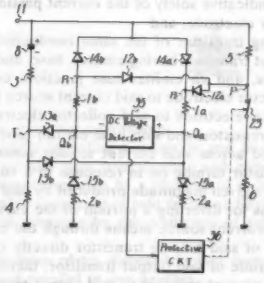
and an integrating device, included in said control signal producing means, for rendering the monitor immune to transients that may otherwise deleteriously affect its operation.

3,996,497

PROTECTIVE CIRCUIT

Kazuhiko Kamimura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,327
Claims priority, application Japan, Jan. 31, 1974, 49-12963
Int. Cl.² H02H *7/20*
U.S. Cl. 317—31 **13 Claims**



1. A protective circuit for an amplifier which is direct cou-

pled to a load through a normally closed switch which includes:

a. a load impedance detecting circuit; and

b. a detecting circuit for detecting an undesirable DC voltage applied to said load;

c. said load impedance detecting circuit comprising first and second DC bridge circuits for detecting said load impedance;

d. means responsive to a detected impedance below a predetermined minimum value for opening said switch;

e. said DC voltage detecting circuit comprising third and fourth bridge circuits; and

f. means responsive to a detected voltage above a predetermined maximum value for opening said switch.

3,996,498

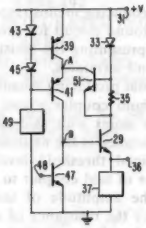
CURRENT LIMITING CIRCUIT AND METHOD

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,900

Int. Cl.² H02H 3/08, 7/20

U.S. Cl. 317—33 VR 10 Claims



1. A current limiting circuit comprising:

a power terminal for an operating potential;

an output terminal;

an output transistor having an emitter electrode connected to said output terminal, and base and collector electrodes;

current source means connected between said power terminal and said base electrode, for supplying base current to said output transistor;

current sensing means connected between said power terminal and said collector electrode, for producing a voltage indicative solely of the current passing into said collector electrode; and

a sensing transistor of the same conductivity type as said output transistor having emitter, base, and collector electrodes, and an emitter-base junction, connected at its collector electrode to said current source means and at its emitter electrode to said collector electrode of said output transistor, and said base emitter junction being connected across said current sensing means, said sensing transistor turning on in response to a voltage of greater than a given magnitude produced by said current sensing means for diverting a portion of the current supplied by said current source means through the collector-emitter path of said sensing transistor directly to said collector electrode of said output transistor, thereby reducing the base current supplied to said output transistor.

3,996,499

ZENER DIODE EFFECT ON LONG ACCELERATION MODULE

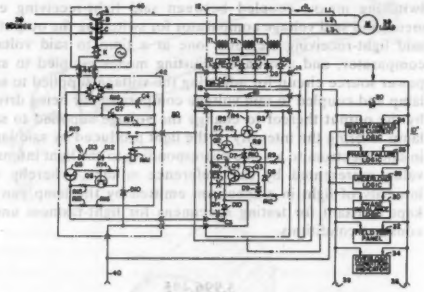
Wardell Gary, and Glenn R. Taylor, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,404

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² H02H 7/08, 3/10

U.S. Cl. 317—36 TD 5 Claims



1. An electrical circuit protecting device, comprising:

sensor means for sensing circuit current in an electrical circuit, said sensor means having an output for providing an output current related to said circuit current;

inverse time overload means having an input which is connected to said output of said sensor means, said overload means providing a trip signal for a circuit breaker trip means, said latter signal being provided at a time which is inversely proportional to the magnitude of said electrical circuit current after said electrical circuit current is sensed and provided said magnitude of said electrical current persists for a predetermined period of time;

long acceleration corrective means connected in parallel circuit relationship with said inverse time means input for overriding said inverse time overload means and preventing the provision of said signal for said circuit breaker means for a fixed period of time regardless of said magnitude of said circuit current once said magnitude of said circuit current attains a predetermined value; and

circuit breaker trip means connected to said inverse time overload means for opening said electrical circuit when said trip signal is provided.

3,996,500

CHASSIS CONNECTOR AND CIRCUIT BOARD CLIP

Ronald A. Coules, Barrington, Ill., assignor to Richco Plastic Company, Chicago, Ill.

Filed June 16, 1975, Ser. No. 586,870

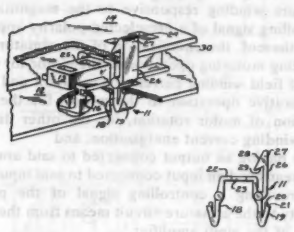
Int. Cl.² H05K 7/12; F16B 2/20, 5/06

U.S. Cl. 317—101 CC 9 Claims

1. A one piece clip of plastic dielectric insulating material for supporting an electrical component on and spaced apart from an apertured chassis in alignment with an electrical connector for said component mounted on the chassis, said clip comprising a pair of spaced apart legs, each of said legs having barbed anchor means adapted to snap engage in said chassis aperture for holding said clip upstanding on the chassis, a wall bridging said legs adapted to support said component thereover, said legs and wall defining a channel for positioning said connector and component in registering alignment with one another for electrical connection between them, a portion of said bridging wall being cut out to permit electrical connection between said component and said connector, and means on said clip to releasably lock said compo-

nent in aligned position with the connector without disturbing the mounting of the connector on the chassis.

8. An apertured chassis and clip system for removably securing an electrical component on and spaced apart from said chassis in alignment with an elongated electrical connector, said clip comprising spaced apart upstanding legs and a wall bridging said legs, said legs each having anchor means snap engaged in the chassis, and lock means for releasably



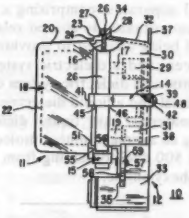
securing the component on the bridging wall aligned for electrical connection with the connector, said legs being adapted to position the connector therebetween in register with the component; and said chassis comprising a panel, an elongated slot in the panel adapted to fit said connector therethrough, and an enlarged aperture in the panel on each side and perpendicular to the longitudinal axis of the slot securing the clip anchor means in the chassis.

3,996,501

LOCKING ARRANGEMENT FOR A WATTHOUR METER ADAPTER ASSEMBLY

Robert W. Tracey, Clemson, S.C., assignor to Sangamo Electric Company, Springfield, Ill.

Filed May 19, 1975, Ser. No. 578,501
Int. Cl.² H02B 9/00
U.S. Cl. 317—105 8 Claims



1. In a watthour meter adapter assembly including a watthour meter having a housing with an annular rim portion and a base member secured to said housing adjacent said annular rim portion, and an adapter assembly including a housing having a rear wall and an annular shoulder portion along its front wall mounting said watthour meter, a locking arrangement detachably securing said watthour meter to said adapter assembly comprising at least one locking member having first and second parallel extending end portions and a rigid leg portion interconnecting said end portions, said first end portion engaging said rim portion of said meter housing, and said second end portion extending along the rear wall of said adapter housing to urge said first end toward said adapter housing to thereby clamp said meter housing to said adapter assembly, and means securing said second end portion to the rear wall of said adapter housing, said means being disposed between said rearward wall of said adapter housing and a mounting surface when said assembly is mounted on said mounting surface to thereby prevent removal of said meter from said adapter assembly while said assembly is mounted on said mounting surface.

3,996,502

THICK FILM CAPACITORS

William R. Bratschun, La Grange, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 2, 1975, Ser. No. 582,955
Int. Cl.² H01G 4/12
U.S. Cl. 317—258 5 Claims

1. A multi-layered thick film circuit deposited on a non-conductive substrate, which has a first temperature coefficient of expansion, forming a capacitor comprising:

a first layer of conductive material;

a second layer of dielectric material;

a third layer of conductive material;

a fourth layer of insulating material having a second temperature coefficient of expansion;

a fifth layer overlying said fourth layer and extending beyond said other layers into contact with said substrate for sealing said circuit and having a third temperature coefficient of expansion equal to or less than said first temperature coefficient and less than said second temperature coefficient; and

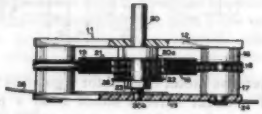
means making electrical connection to said first and third conductive layers.

3,996,503

VARIABLE CAPACITOR

Sohji Ichikawa, Tokyo, Japan, assignor to Toko Incorporated, Tokyo, Japan

Filed June 17, 1975, Ser. No. 587,698
Claims priority, application Japan, June 18, 1974, 49-70885; Oct. 4, 1974, 49-120076; Oct. 4, 1974, 49-120075
Int. Cl.² H01G 5/06
U.S. Cl. 317—253 1 Claim



1. A variable capacitor comprising:

a frame structure including a substrate and backing plate arranged parallel with one another and connected together in spaced relation by a plurality of rods;

a shaft rotatably supported in said frame and axially urged toward said substrate by the resiliency of said backing plate;

a plurality of stator plates disposed in said frame member and arranged parallel to one another;

a plurality of rotor plates fixed to said shaft and arranged in parallel spaced relation to one another;

first spacer means disposed around said shaft and between said rotor plates to retain said rotor plates in spaced relation, wherein said first spacer means are annular spiral members having a plurality of turns and formed of wire with a circular cross-section, and wherein each spacer means separates the rotor plates by a distance equal to one diameter of the wire;

second spacer means disposed around each of said rods and between said stator plates to retain said stator plates in spaced relation, wherein said second spacer means are annular spiral members having a plurality of turns and formed of wire with a circular cross-section, and wherein each spacer means separates the rotor plates by a distance equal to one diameter of the wire;

a nut threaded on said shaft between said backing plate and the adjacent rotor plate;

a flat washer disposed on said shaft adjacent to said nut; and

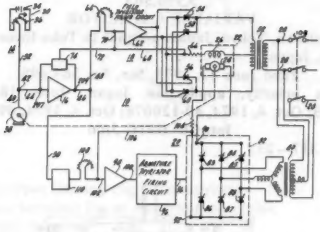
a cup-shaped washer having an open side and a closed side, wherein the closed side abuts the rotor plate and the open side abuts the flat washer, and wherein the open side defines an opening having an area larger than the area defined by said nut, so that when the nut is tightened the flat washer deforms into the opening thereby negating deformation of the rotor plates.

3,996,504

REGENERATIVE MOTOR CONTROL HAVING FIELD AND ARMATURE COORDINATING MEANS

Chester Joseph Grzebielski, Grafton, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 24, 1975, Ser. No. 571,209
Int. Cl.² H02P 3/14
U.S. Cl. 318—258 **10 Claims**



1. A regenerative motor control for regulating the operative condition of a direct current motor from a power source between the motoring and regenerative states in accordance with a bi-polarity operative condition error signal produced by a motor operative condition error signal source, said control comprising:

input amplifier means having an input couplable to the error signal source and an output providing a bi-polarity output signal;

field circuit means having an input coupled to said input amplifier and an output connectable to the field winding of the motor, said field circuit means being responsive to said output signal for providing current energization in either direction through the motor field winding and for reversing the current energization from a first direction through zero to a second direction during a transient period initiated by a reversal of the polarity of the error signal;

signal means connected to said field circuit means for providing a signal proportional in magnitude to the magnitude of the motor field winding current energization and having a polarity indicative of the direction of said energization;

limiting means having an input receiving the signal from said signal means and an output connected to said input amplifier for limiting the output signal of said amplifier in accordance with the magnitude and polarity of the signal from said signal means to restrict the magnitude of the output signal in the initial portion of the transient period and under weak field conditions;

an armature circuit means having an output connectable to the armature winding of the motor for energizing the armature winding responsive to the magnitude of the controlling signal of a preselected polarity applied to an input thereof, the energization of the armature winding providing motoring operation to the motor for one direction of field winding current energization and providing regenerative operation to the motor, for the motoring direction of motor rotation, for the other direction of field winding current energization; and

circuitry having an output connected to said armature circuit means and an input connected to said input amplifier for providing a controlling signal of the preselected polarity to the armature circuit means from the bipolarity signal of the input amplifier.

3,996,505

CAPACITOR WITH LIQUID POLYBUTENE DIELECTRIC

John Lapp, Franklin, and Fred S. Sadler, Racine, both of Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.

Filed Aug. 5, 1974, Ser. No. 494,767
Int. Cl.² H01G 4/22
U.S. Cl. 317—259 **16 Claims**

1. An electrical apparatus, comprising a pair of electrical conducting elements situated in spaced relation with respect to each other and being adapted to provide an electrical potential therebetween, and a dielectric system interposed between said elements, said dielectric system comprising a layer of polymeric material and a liquid dielectric impregnated into said polymeric material, said liquid dielectric comprising polybutene having an average number molecular weight in the range of 300 and 500 and containing from 0.01% to 10% by weight of a cyclohexylamine.

3,996,506

INRUSH CURRENT LIMITER

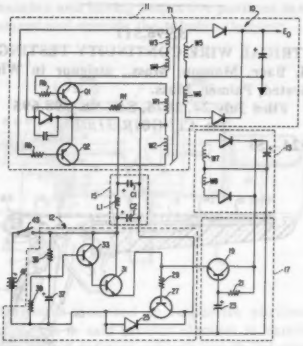
Robert A. Kichak, Greenbelt, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 6, 1975, Ser. No. 538,982
Int. Cl.² H02M 1/08
U.S. Cl. 321—13 **7 Claims**

1. In a converter which includes a transformer having a plurality of input and output windings, a transistor oscillator circuit whose output is coupled to a pair of said input windings, a DC power source for energizing said transistor oscillator circuit, the circuit improvement which comprises:

active control circuit means connected between said DC power source and the input to said transistor oscillator circuit for substantially limiting current surges and the rate of current rise during the initial application of power to said transistor oscillator circuit from said DC power

source, said active control circuit current limiting means comprising a control transistor whose collector and emitter are connected in series between said DC power source and said transistor oscillator circuit input and control means connected to the base of said control

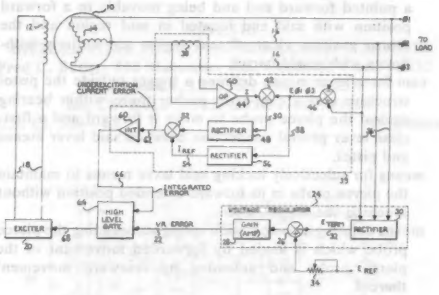


transistor for gradually increasing the conduction of said control transistor after the initial application of power from said DC power source, said control means including a timing circuit further including a capacitor connected in parallel with said DC power source and a pair of Darlington driver transistors.

3,996,507
REGULATOR FOR CONTROLLING SYNCHRONOUS DYNAMOELECTRIC MACHINES

George S. Chambers, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 27, 1975, Ser. No. 608,282
Int. Cl.[2] H02P 9/14
U.S. Cl. 322—20 8 Claims



1. An improved regulating system for controlling the output voltage of a synchronous alternating current dynamoelectric machine having a field winding comprising:

a. exciter means for providing a controllable excitation current to said field winding;

b. regulator means responsive to the output voltage of said dynamoelectric machine for generating a first signal for use in controlling the field winding excitation current to maintain the output voltage of said dynamoelectric machine at a specific value;

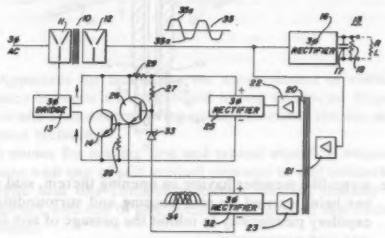
c. sensing means responsive to the reactive current in said dynamoelectric machine for generating a second signal having a value proportional to the difference in the values of the machine reactive current and a desired reactive current limit derived from the output voltage, said second signal serving to control the field winding excitation current to maintain the output voltage at said specified value when the machine reactive current exceeds a predetermined value defined by said desired reactive current limit; and,

d. selecting means responsive to said first and second signals for selectively providing a control signal to said exciter means proportional to the value of the one of said first and second signals of greater magnitude to thereby control the magnitude of the excitation current provided to said field winding by said exciter means.

3,996,508
THREE PHASE PRIMARY POWER REGULATOR

Ralph Board, Park Ridge, Ill., assignor to Northrop Corporation, Rolling Meadows, Ill.

Filed Nov. 20, 1972, Ser. No. 308,147
Int. Cl.[2] G05F 1/48
U.S. Cl. 323—6 30 Claims



1. A three phase primary power regulator, comprising:

a source of three phase power;

means defining a common ground reference potential;

three impedance elements connected with said source, forming a three phase, wye connected circuit, each impedance element having its neutral terminal isolated from the neutral terminals of the other impedance elements and from said reference potential means;

a three phase full wave diode bridge circuit connected with the neutral terminals of said wye connected impedance elements and isolated from said reference potential means;

a variable impedance device having an impedance which is generally continuously variable from a low value to a high value in accordance with a control voltage applied thereto, connected with said three phase bridge circuit and in series with said elements across said source;

an output circuit for deriving energy from said impedance elements; and

a feedback circuit, isolated from said reference potential means, responsive to voltage across said impedance elements to control the impedance of said variable impedance device between said low value and said high value to regulate the energy derived in the output circuit, maximum energy being derived when the impedance of the device is low, and the peaks of voltage and current of each of the three power phases from said source being clipped as the impedance of the device increases from the low value to the high value.

3,996,509
CONDUCTIVITY DIP CELL

Edward J. Seger, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 12, 1975, Ser. No. 604,005
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 B 4 Claims

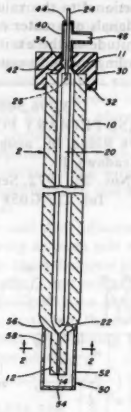
1. An improved conductivity dip cell for measuring the electrical conductivity of a liquid which comprises:

a. a hollow non-conductive housing;

b. an electrical conductor within said housing;

c. terminal means externally mounted on said housing and in electrical communication with said conductor;

d. a capillary passageway through said housing to said conductor; and



e. a cap-like member having an opening therein, said member being carried by said housing and surrounding said capillary passageway to inhibit the passage of non-liquids into said passageway.

3,996,510

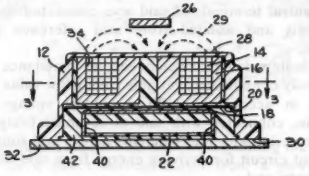
SHIELDING ARRANGEMENT FOR SENSING THE PROXIMITY OF A METALLIC OBJECT

Robert Charles Guichard, Normal, Ill., assignor to General Electric Company, New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,683

Int. Cl.² G01R *33/12*

U.S. Cl. 324—41 **9 Claims**



1. A shielding arrangement for a metal proximity sensor operating at frequencies above 40 KH_z, said sensor including a housing having a sensing surface and a mounting surface opposite said sensing surface, a coil positioned within said housing and adjacent said sensing surface for generating a magnetic field, a ferromagnetic core having a cavity therein for receiving and supporting said coil, and circuit means electrically coupled to said coil for actuating an external load when a metal being detected passes near said sensing surface and through the magnetic field generated by said coil, said shielding arrangement comprising:

a. a first shield comprised of ferromagnetic material for shielding the magnetic field generated by said coil from magnetic and electromagnetic energy generated externally of said mounting surface of said housing, said circuit means being disposed between said first shield and said mounting surface; and

b. a second shield comprised of a metal layer having a resistivity of less than 3 μohm centimeters for preventing the electromagnetic field generated at frequencies at least equal to and greater than 40 KH_z by said coil from penetrating out of said sensor through said mounting surface, said second shield being disposed between said first shield and said core, whereby said second shield is closer to said coil and said core than is said first shield.

3,996,511

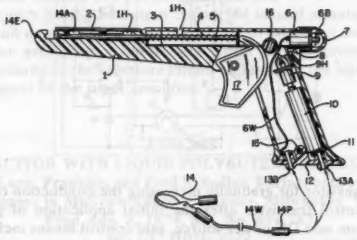
ELECTRICAL WIRE CONTINUITY TESTING GUN

Richard I. Baer, Monson, Mass., assignor to Wire Tester, Incorporated, Palmer, Mass.

Filed July 24, 1975, Ser. No. 598,695

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **8 Claims**



6. In a pistol-form electrical continuity tester system for testing electrical continuity of conductors in both powered and powerless systems, and including electrical circuit defining means and an improved pistol form tester with a hand grip and barrel support body, comprising,

means defining an elongated pistol barrel with open front and rear ends constituting an integrally formed extension of said hand grip and barrel support body,

means defining a grappling hook adjacent the front end of said barrel which defines therewith a region for placing a wire to be tested and guard walls for locating such wire,

means defining a pierce probe within said barrel comprising a pointed forward end and being movable to a forward position with said end located in said region and the return position clear of said region and entirely withdrawn within said barrel,

cam-form lever means defining a trigger outside the pistol structure and a cam-form pusher there within bearing against the pierce probe to move it forward and a first-class lever pivotal connection between said lever means and pistol,

means for selectively locking said lever means to maintain the pierce probe in its forward extended position without touching the trigger, and

means defining a compression spring surrounding the pierce probe which is loaded by forwarded movement of the pierce probe and unloaded by rearward movement thereof.

3,996,512

CONTAINER FOR RECEIVING AN INSULATING OR COOLING MEDIUM FOR ELECTRICAL APPARATUS TO BE TESTED FOR RESISTANCE TO ELECTRICAL BREAKDOWN

Josef Baur, No. 272, 6832 Sulz (Vorarlberg), Austria

Filed Apr. 10, 1975, Ser. No. 566,906

Claims priority, application Austria, Apr. 19, 1974, 3284/74

Int. Cl.² G01R *27/26*

U.S. Cl. 324—61 P **10 Claims**

1. A container for testing a fluid medium for resistance to electrical breakdown comprising:

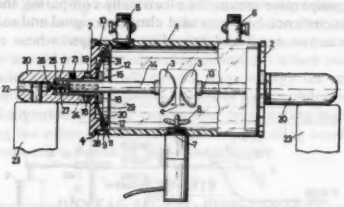
a. a tubular element having an axis and two open, axial ends;

b. two closure elements releasably fastened to said tubular element in fluid-tight engagement and closing said open

ends, an inlet aperture and an outlet aperture being formed in at least one of said elements;

c. two valves respectively mounted in said apertures for opening and closing the same.

d. an electrode rod mounted on each closure element, said electrode rod passing axially through the associated closure member and having respective portions in said tubular element and outside the tubular element;



e. two electrodes mounted on respective portions of said electrode rods in said tubular element in axially spaced relationship and defining a spark gap therebetween; and

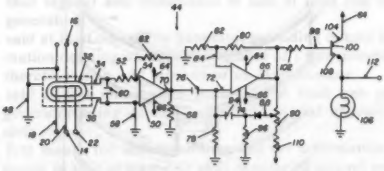
f. means for applying a test voltage to said electrodes through said electrode rods, said electrodes being dimensioned for axial movement through said open ends while connected to said closure elements by said electrode rods.

3,996,513

DIFFERENTIAL MICROAMPERE CURRENT SENSOR

Fred C. Butler, 332 Macomber Rd., Chehalis, Wash. 98532

Filed Apr. 24, 1975, Ser. No. 571,237
Int. Cl.² H01F 15/02; G01R 27/02, 31/02
U.S. Cl. 324—62 14 Claims



1. A sensor for a differential current detector, said sensor comprising first, second, and third mutually insulated conductors, said first, second, and third conductors being rigidly fixed with respect to each other within said sensor;

a multi-turn sensor coil positioned around said conductors, said first, second, and third mutually insulated conductors each being rigidly fixed with respect to said sensor coil so that differential currents between said first, second, and third conductors are detected by said sensor coil; and

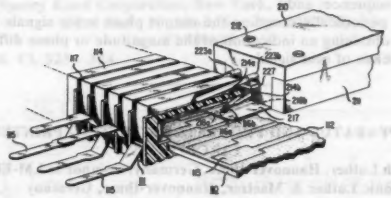
a magnetic shielding housing positioned around said sensor coil and the portion of said first, second, and third conductors within said sensor coil to substantially shield said sensor coil from other magnetic fields.

3,996,514

CIRCUIT BOARD CONTACT RESISTANCE PROBE

Vernon Letchworth Brown, Boulder; Leo Carrillo, Denver, and Nawal Kishore Sharma, Broomfield, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1975, Ser. No. 634,254
Int. Cl.² G01R 27/02
U.S. Cl. 324—62 10 Claims



1. Apparatus for facilitating the measurement of contact resistance between a circuit board having conductor fingers thereon and a connector having contact elements therein, said apparatus including

first means for making first and second electrical connections with one of said contact elements in said connector while said one connector contact element remains in contact with one of said conductor fingers on said circuit board,

second means for making first and second electrical connections to one of said conductor fingers on said circuit board while said one conductor finger remains in contact with said one contact element in said connector, and

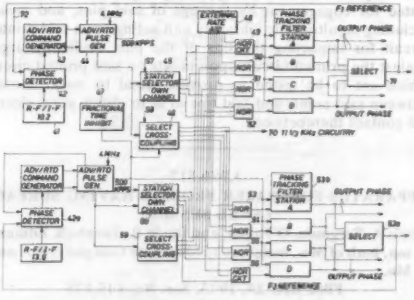
means for holding said first and second means in a predetermined spatial relationship with respect to one another.

3,996,515

METHOD FOR FREQUENCY CROSS-COUPLING OF CHANNELS IN AN OMEGA NAVIGATION RECEIVER SYSTEM

Otto J. Baltzer, and Spurgeon E. Smith, both of Austin, Tex., assignors to Tracor, Inc., Austin, Tex.

Filed Apr. 28, 1975, Ser. No. 571,920
Int. Cl.² G01R 25/00
U.S. Cl. 324—83 FE 10 Claims



1. In a multiple frequency phase tracking receiver, a method of cross-coupling receiving differing frequency signals which method optimizes intrinsic phase relationships between sets of discrete frequency signals transmitted from a single location, the method comprising the steps of:

a. receiving a plurality of discrete frequency signals, said signals being then amplified and filtered for further processing;

b. inputting each of said discrete frequencies to a plurality of phase detectors for detecting a phase difference between each of said discrete frequencies and a reference signal, the phase difference obtained from each phase detector comprising an output phase error signal;

c. combining the output phase error signals obtained from each of the phase detectors;

d. supplying the signal obtained from step (c) to each of the phase detectors as reference signals for comparison with each of said discrete frequency signals in a next received sequence; and

e. periodically sampling the output phase error signals for obtaining an indication of the magnitude or phase difference of said signals.

3,996,516

APPARATUS AND PROCESS FOR TESTING PRINTED CIRCUITS

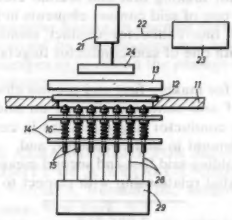
Erich Luther, Hannover-Ihme, Germany, assignor to LM-Electronic Luther & Maelzer, Hannover-Ihme, Germany

Filed Aug. 23, 1974, Ser. No. 499,904

Claims priority, application Germany, Aug. 23, 1973, 2344239

Int. Cl.² G01R 1/06, 31/02

U.S. Cl. 324—158 F **3 Claims**



1. In an apparatus for testing printed circuits, the combination of spaced guide plate means with opposed openings therethrough, a plurality of measuring pins mounted in said opposed openings for axial movement therein and resiliently urged to contacting positions by means of springs positioned between said spaced guide plate means and acting upon said pins, said pins having their tips engageable with metal points on a printed circuit to be tested and each pin tip comprising a conical point, means for supporting a printed circuit to be tested for engagement by the tips of said pins, and means including an ultrasonic vibratory unit acting upon said printed circuit for impacting the tips of the pins resiliently urged against the printed circuit upon points on said printed circuit which are to be tested to provide metal to metal contact between said points and said tips so as to obtain good electrical contact therebetween.

3,996,517

APPARATUS FOR WAFER PROBING HAVING SURFACE LEVEL SENSING

Lewis A. Fergason, O'Fallon, and David R. Turnbull, Edmundson, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,175

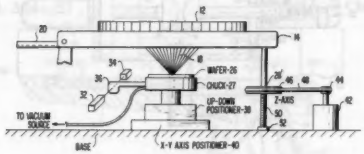
Int. Cl.² G01R 31/02

U.S. Cl. 324—158 P **7 Claims**

1. In an apparatus for applying a predetermined electrical test sequence from a test sequencer to semiconductor devices on wafers, said apparatus including a chuck for mounting said wafers, at least one probe to make electrical contact with one of said semiconductor devices, said chuck being capable of periodically moving toward and away from said robe while moving in a predetermined sequence transversely with respect to said probe such that said probe makes contact sequentially with all of said semiconductor devices located on said wafer, said chuck providing a chuck up signal when it is in its closest proximity to said probe, said apparatus including surface sensing means for providing a surface sense signal when said probe contacts said semiconductor device, the improvement comprising:

Z-axis adjustment means for varying the distance between said probe and said chuck;

time comparator means for electrically comparing the time of occurrence between said chuck up signal and said surface sense signal and providing an output whose magnitude is proportional to the time difference between the signals and whose polarity reflects which signal was first applied to said time comparator means;



controller means, responsive to the output of said time comparator means, for moving said adjustment means in response to signals from said time comparator means such that said probe is moved closer to said chuck if the chuck up signal precedes the surface sense signal and said probe is moved further away from the chuck if said surface sense signal precedes the chuck up signal, said movement being proportional to the difference in time between said signals.

3,996,518

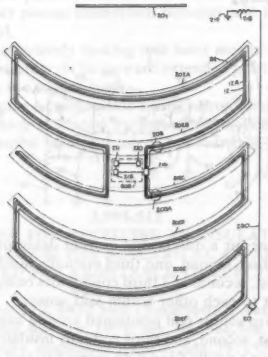
INDUCTIVE CARRIER COMMUNICATION SYSTEMS

William S. Halstead, Woodland Hills, and Richard W. Burden, Canoga Park, both of Calif., assignors to Carrier Communication, Inc., New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,763

Int. Cl.² H04H 1/04

U.S. Cl. 325—54 **10 Claims**



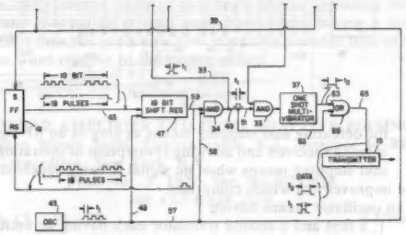
1. A communication system of the inductive-signaling type for use in drive-in motion picture theaters and the like having rows of designated parking spaces therein comprising a carrier wave generator which generates a carrier wave within the designated broadcast band which can be received by conven-

tional automobile radios, means for modulating the carrier wave energy from said generator, means coupling the output of said generator to the center conductor of a coaxial cable having a conducting sheath around said center conductor which conducting sheath is held at the same ground potential as said carrier wave generator, at least one inductive-signaling conductor extending across more than one of said designated parking spaces along one of said rows of designated parking space, said inductive-signaling conductor having a coupling means connecting one end of said inductive-signaling conductor to said center conductor whereby a controlled amount of carrier wave energy may be transferred from said center conductor to said inductive-signaling conductor which inductively transmits said modulated carrier wave energy for receipt by the conventional automobile radios of automobiles parked in said designated parking spaces and terminating means connecting the other end of said inductive-signaling conductor to the conductive sheath of said coaxial cable.

3,996,519
DIGITAL SIGNAL PROCESSOR

Peter B. Wagner, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1975, Ser. No. 592,851
Int. Cl.² G01R 7/00
U.S. Cl. 325—142 **7 Claims**

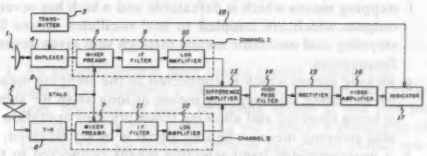


1. A digital signal processor comprising
a. an analog to digital convertor for converting analog information into digital information comprising bits of 1's and 0's;
b. at least one shift register;
c. at least one parity generator;
d. said digital information from said analog to digital convertor being transmitted to and stored in said at least one shift register and transmitted to said at least one parity generator;
e. said at least one parity generator providing output information defining whether the number of 1 bits transmitted thereto was an odd number or an even number;
f. said output information from said at least one parity generator being applied and stored in said at least one shift register;
g. first means for serially shifting out the information bits stored in said at least one shift register to second means for converting the 0's from said at least one shift register into pulses of a first time duration t_1 and 1's from said at least one shift register into pulses of a second time duration t_2;
h. said analog to digital convertor provides a first output signal when the conversion of the analog information into digital information is complete;
i. said first output signal being applied to the enable input of said at least one shift register and to the set input of a first flip-flop circuit;
j. the output of said first flip-flop circuit being applied to the input of a control shift register;
k. an oscillator having its output connected to another input of said control shift register; and
l. the output of said control shift register connected to second means for controlling the shift sequence of said at least one shift register.

3,996,520
INTERFERENCE REJECTING LOGARITHMIC RECEIVER

William F. Frost, Stewart Manor; Philip Kassel, Sea Cliff, both of N.Y., and Charles M. Clothier, deceased, late of Farmingdale, N.Y. (by Agnes Clothier, administratrix), assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 30, 1962, Ser. No. 205,475
Int. Cl.² H04B 1/10
U.S. Cl. 325—324 **4 Claims**

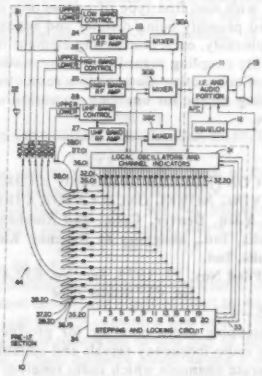


1. A pulsed signal receiver comprising
a pair of antennas having non-identical radiation characteristics for receiving desired pulsed signals and interfering signals of higher duty cycle than said desired signals,
a pair of logarithmic receiver channels respectively coupled to said antennas,
means coupled to said channels for differentially combining the outputs thereof,
and a fast time constant circuit coupled to the output of said differentially combining means, said circuit being adapted to transmit said desired signals and to reject all other signals having a duty cycle higher than that of said desired signals.

3,996,521
SIGNAL-SEEKING RADIO RECEIVER WITH BAND TUNING AND SELECTING MEANS

Kenneth R. Owens, Indianapolis, Ind., assignor to Regency Electronics, Inc., Indianapolis, Ind.

Filed Nov. 17, 1975, Ser. No. 632,474
Int. Cl.² H04B 1/34
U.S. Cl. 325—470 **18 Claims**



1. In a stepping radio receiver for production of audio signals from radio frequency signals and capable of tuning to several separate channels on a plurality of bands, which radio receiver includes:
a. a pre-IF section having an RF signal receiving means,

mixer means, and an oscillator means; said pre-IF section being operable on a plurality of distinct bands;

b. said RF signal receiving means being for providing sufficient RF signal lever for said mixer means;

c. said mixer means being coupled to the RF signal receiving means;

d. An audio detection means coupled to said mixer means for producing an audio signal when an RF signal is being received, said audio detection means including squelch means for preventing the production of an audio signal when an RF signal is not being received;

e. said oscillator means being coupled to said mixers and operable at a given several frequencies, there being one frequency for each channel to which the receiver can tune;

f. stepping means which is defeatable and which has several outputs which are coupled to said oscillator means for stepping said oscillator means through said given several frequencies;

g. locking means which is connected to the stepping means for defeating said stepping means as long as an RF signal is being received and allowing resumption of operation of said stepping means when no signal is being received;

h. a programmable band-selecting means connected to the pre-IF section of the receiver and to the stepping means for determining the band of operation of the receiver;

i. said programmable band selecting means including a plurality of enabling means, each enabling means being for enabling operation on one of the bands;

The improvement which comprises:

a programmable band selecting means having

1. several wires and several first type of connecting elements, each wire having at its first end a first type of connecting element and being coupled at its second end to a respective one of the outputs of said stepping means;

2. a first plurality of a second type of connecting elements which are of a design which permits them to mate with said first type of connecting elements, each element of said first plurality being

a. electrically connected to the second end of a respective one of said several wires regardless of any mating with a first type of connecting element and

b. coupled to a respective one of the outputs of said stepping means regardless of any mating with a first type of connecting element; and

3. a second plurality of a second type of connecting elements which are of a design which permits them to mate with said first type of connecting elements, said second plurality being distinct and separate from said first plurality, each connecting element of said second plurality coupling regardless of any mating with a first type of connecting element to a respective one of said enabling means for enabling operation on one of the bands.

3,996,522

CRYSTAL CONTROLLED STEPPING RADIO RECEIVER HAVING NOVEL OSCILLATOR CIRCUIT

Richard C. Koch, Denver, Colo., and Stephen J. Hoffman, Indianapolis, Ind., assignors to Regency Electronics Inc., Indianapolis, Ind.

Filed Nov. 17, 1975, Ser. No. 632,473

Int. Cl.² H04B 1/34

U.S. Cl. 325—471 **13 Claims**

1. In a stepping radio receiver for production of audio signals from radio frequency signals and capable of tuning to several separate channels which radio receiver includes:

a. an RF signal receiving means, a mixer, and an oscillator means;

b. said RF signal receiving means being for providing sufficient RF signal level for said mixer means;

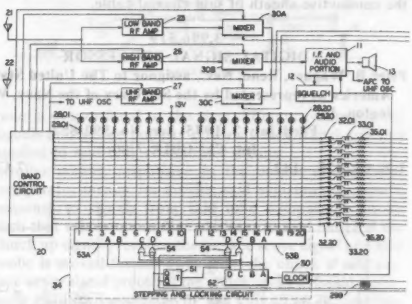
c. said RF signal receiving means and said oscillator means being coupled to said mixer means;

d. an audio detection means coupled to said mixer means for producing an audio signal when an RF signal is being received, said audio detection means including squelch means for preventing the production of an audio signal when an RF signal is not being received;

e. said oscillator means being coupled to said mixers and operable at a given several frequencies, there being one frequency for each channel to which the receiver can tune; said oscillator means including several piezoelectric crystals for determining the frequency of oscillation of said oscillator means;

f. stepping means which is defeatable and which has several outputs which are coupled to said oscillator means for stepping said oscillator means through said given several frequencies;

g. locking means which is connected to the stepping means



for defeating said stepping means as long as an RF signal is being received and allowing resumption of operation of said stepping means when no signal is being received;

the improvement which comprises:

an oscillator means having

1. a first and a second transistor each having an emitter, base and collector, the emitter of said first transistor connecting directly to the base of said second transistor and the base of said first transistor connecting to said several crystals;

2. means for causing said collector of said first transistor to be at A.C. ground;

3. a capacitor connected between the emitter of said second transistor and the base of said first transistor; and

4. a first parallel LC circuit coupled to the emitter of said second transistor.

3,996,523

DATA WORD START DETECTOR

Anton Schmid, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed May 19, 1975, Ser. No. 578,751

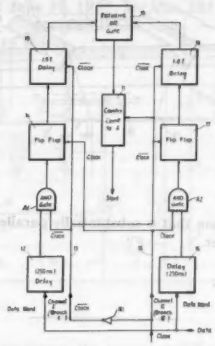
Claims priority, application Germany, May 24, 1974, 2425147

Int. Cl.² H03K 5/20

U.S. Cl. 328—110 **7 Claims**

1. A word start detector for a digital data transmission network in an avionics system using data words and timing pulses variable in time from the data words by a predetermined maximum as well as stop code pulses, said detector comprising two switching branches, means for applying data words to the two branches, first logic means in one of the branches for responding to the data words and the timing pulses at relative phases which retain the stop code pulses, second logic means in the other branch for responding to the data words and the timing pulses at relative phases which eliminates the stop code pulses, first pulse stretching means in

one of the branches coupled to said first sampling means and second pulse stretching means in one of the branches coupled to said second sampling means for stretching the outputs of said sampling means, means coupled to said first and second



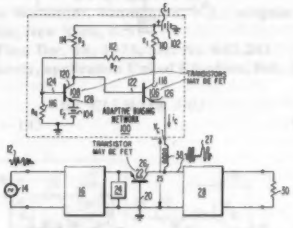
stretching means for comparing signals at the output of said stretching means, each of said logic means including delay means coupled to at least one channel and having a delay greater than the predetermined maximum variable time of the data word relative to the timing pulses.

3,996,524

LINEAR AMPLIFIER UTILIZING ADAPTIVE BIASING

Franco Nicola Sechi, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,088
Int. Cl.² H03F *3/16*
U.S. Cl. 330—35 **4 Claims**



1. A linear amplifier for a radio frequency (RF) input signal, said RF input signal being amplitude modulated, said amplifier being of the type having a DC input-port and a DC output-port and including a first transistor having first, second and third electrodes; first biasing means connected across said input-port for providing a first biasing voltage across said first and second electrodes, and second biasing means, connected across said output-port, for providing a second biasing voltage across said first and third electrodes and a current through said third electrode, said third electrode current varying in accordance with the amplitude of said RF input signal, said amplifier generating an output signal across said first and third electrodes; wherein the improvement comprises:

said second biasing means including positive feedback means for varying said second bias voltage in accordance with said third electrode current;

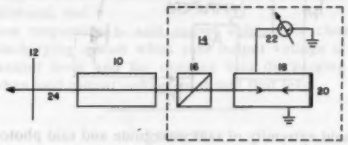
whereby phase and amplitude distortion in said output signal are substantially reduced.

3,996,525

ACOUSTO-OPTICALLY TUNED LASER

Richard Swart Hughes, China Lake, Calif.; Michel Paul Imbert, Longjumeau, France, and Thomas F. Nowicki, New Milford, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,496
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 C **2 Claims**



1. An acousto-optical laser tuning system comprising:

a laser cavity including a lasing cell and beam of laser emission, bounded by fixed reflecting means at one end for substantially totally reflecting the optical wavelengths of interest that are incident thereon and a laser output mirror at the opposite end providing the output of said system;

intracavity means for tuning said laser, including means for subjecting wavelengths of said beam to a selectable number of rotations of polarization, including fixed first means for polarizing said beam one increment of rotation per pass, second polarizing means for polarizing said beam one increment of rotation per pass in response to an electrical signal that includes an electronically tuneable filter, wherein said fixed reflecting means is attached to an end of said filter and is retroreflective such that the wavelengths transmitted by said filter are reflected by said retroreflective means, and further includes an electrical source coupled to said filter that provides a signal of radio frequency white noise to said filter, such that all optical wavelengths corresponding to said signal of white noise that are transmitted by said filter undergo a 90° rotation of polarization, and means for selectively interrupting polarization by said second means, such that the beam wavelength to which the system is tuned corresponds to said interruption, whereby laser oscillation is maintained during said interruption at the wavelength corresponding to said interruption;

wherein the wavelength to which the system is tuned is subjected to fewer rotations of polarization than other wavelengths of said beam, such that the wavelength to which the system is tuned is provided in said system output.

3,996,526

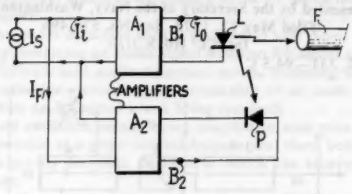
OPTICAL RADIATION GENERATOR ELECTRICALLY CONTROLLED

Luigi d'Auria, and Daniel Ostrowsky, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 30, 1975, Ser. No. 592,055
Claims priority, application France, July 5, 1974, 74.23408
Int. Cl.² H01S *3/13*
U.S. Cl. 331—94.5 S **6 Claims**

1. An optical radiation generator electrically controlled by a control current comprising a pair of input terminals adapted for receiving said control current, a first linear current amplifier having an input connected to said pair of input terminals and an output, a light emissive diode having a control input connected to the output of said first amplifier and a radiating surface emitting said optical radiation, an optical fiber waveguide, for transmitting said optical radiation, having an extremity located close to said radiating surface, a photodiode having a detecting face located close to said radiating surface and an output for delivering a feedback current, said optical

fiber waveguide and said photodiode being optically coupled to said radiating surface through a material transparent to said optical radiation, said material encasing said light emissive



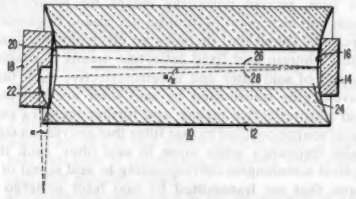
diode, said extremity of said waveguide and said photodiode, and a second linear current amplifier having an input coupled to said output of said photodiode and an output coupled to the input of said first amplifier.

3,996,527

GAS LASER OPTICAL SYSTEM

Karl Gerhard Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 30, 1975, Ser. No. 600,508
Int. Cl.² H01S *3/08*
U.S. Cl. 331—94.5 C **7 Claims**



1. In a laser, an optical system comprising:
a laser discharge tube;
a first light reflector means having a single reflective surface at one end of the tube; and
a second light reflector means at the opposite end of the laser tube, the second reflector means having a plurality of facets for reflecting the light traveling through the laser tube so as to form a folded optical cavity.

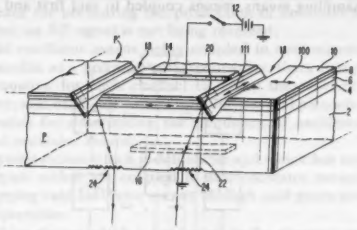
3,996,528

FOLDED CAVITY INJECTION LASER

Joseph Martin Blum, Yorktown Heights; Eric Gung Hwa Lean, Mahopac, and James Cleary McGroddy, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,738
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **7 Claims**

1. A folded cavity injection laser comprising a p-n junction in the body of said laser and electrodes electrically coupled to said p-n junction whereby current through said electrodes produces light emission across said p-n junction in a plane that is perpendicular to the direction of current flow through said laser,
two mirror-like surfaces, integral with the body of said laser, facing each other and each disposed at an angle greater than 45° to the plane of said p-n junction so that lasing light is reflected in a direction that is not parallel to said current direction, and
light diffracting means, in the body of said laser and in the path of said reflected light, for diffracting the latter into a path that returns the light to the mirror-like surfaces and hence to the p-n junction region of said laser as well as diffracting a portion of said reflected light out of the laser



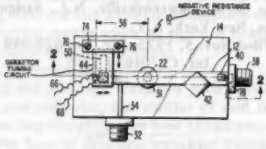
in a direction that is substantially parallel to current flow in said laser.

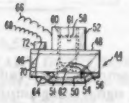
3,996,529

VARACTOR TUNING APPARATUS FOR A STRIP TRANSMISSION LINE DEVICE

Walter Richard Curtice, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 22, 1975, Ser. No. 579,970
Int. Cl.² H03B *7/14*; H03F *3/04*; H01P *7/00*; H03H *5/12*
U.S. Cl. 331—99 **17 Claims**





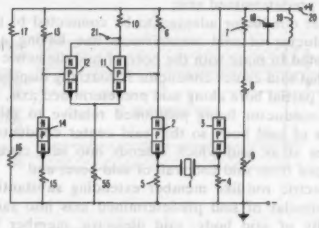
1. In a negative-resistance radio frequency device of the type wherein an active solid-state element is included in a strip transmission line, said strip transmission line having a resonant conductive strip section, said device having predetermined operating characteristics wherein the improvement comprises a separate varactor circuit for tuning said device, said varactor circuit including means to indirectly couple said varactor circuit to said strip transmission line, and a varactor mounted on a dielectric substrate, said dielectric substrate having a ground plane and a resonant conductive strip, means, including said indirectly coupled means, for RF coupling said varactor circuit to said strip transmission line of said device, and means for tuning said device by electrically varying the capacitance of said varactor and varying thereby the reactance of said strip transmission line of said device.

3,996,530

BUTLER OSCILLATOR

Claude Herbert Feistel, Austin, Tex., and Philip Theodore Gianos, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,592
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R 9 Claims



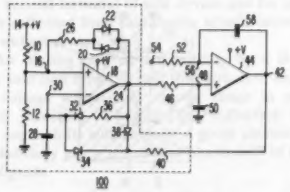
1. In a Butler oscillator, the improvement comprising:
an amplitude limiting differential amplifier having an input connected to an output of a voltage amplifier stage of said oscillator, said limiting amlifier having a first output connected in a feedback path of said oscillator to a filter, said filter being connected to an input of an impedance matching stage of said oscillator and said amplifier having a second output of a portion of said amplifier outside said feedback path, said second output being connected to a signal output terminal for providing a square wave output signal from said oscillator.

3,996,531

OSCILLATOR CIRCUIT WHOSE FREQUENCY IS VOLTAGE CONTROLLABLE WHICH CONTAINS A COMPARATOR

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,241
Claims priority, application United Kingdom, Feb. 17, 1975, 06618/75
Int. Cl.² H03K 3/02
U.S. Cl. 331—143 9 Claims



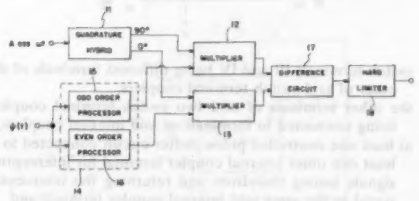
1. An oscillator circuit comprising, in combination:
a voltage comparator having first and second voltage input terminals and an output terminal for producing an output voltage at a first level when the voltage at said second input terminal is greater than at said first input terminal and a second level otherwise;
means responsive to said output voltage for applying a feedback voltage to said second input terminal which is of a first value when said output voltage is at said first level and of a second value when said output voltage is at said second level;
charge storage means coupled between said first input terminal and a point at a reference potential;
a charging circuit coupled between said comparator output terminal and said first input terminal including means responsive to said output voltage when at its first level for closing said circuit thereby permitting said charge storage means to charge, and responsive to said output voltage when at its second level for opening said charging circuit;
a control terminal to which a control voltage source may be applied;
a discharging circuit separate from said charging circuit coupled between said first input terminal and said control terminal; and
means responsive to said output voltage for closing said discharging circuit when said output voltage is at said second level and for opening said discharging circuit when said output voltage is at said first level.

3,996,532

PHASE MODULATING WITH ODD AND EVEN FINITE POWER SERIES OF A MODULATING SIGNAL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Chase P. Hearn, Williamsburg; Richard H. Couch, Mathews, and Lewis R. Wilson, Newport News, all of Va.

Filed Sept. 29, 1975, Ser. No. 617,895
Int. Cl.² H03C 3/02
U.S. Cl. 332—22 6 Claims



1. A phase modulator for modulating a carrier input signal $A\cos\omega t$ with a modulating input signal $\Psi(t)$ comprising:
means receiving said carrier input signal for producing two quadrature components of said carrier input signal;
means receiving said modulating input signal for generating a first signal defined by the finite power series

$$k_0 - k_2\Psi^2(t) + k_4\Psi^4(t) - \ldots - k_{n-1}\Psi^{n-1}(t)$$

means receiving said modulating input signal for generating a second signal defined by the finite power series

$$k_1\Psi(t) - k_3\Psi^3(t) + k_5\Psi^5(t) - \ldots - k_n\Psi^n(t)$$

a first multiplier means for multiplying one of said quadrature components with said first signal;
a second multiplier means for multiplying the other of said quadrature components with said second signal;
means for subtracting the output of said second multiplier from said first multiplier; and
means included with said means for generating said first and second signals for changing the values of k_i, $i = 0,1,2, \ldots, n$, to obtain a linear relationship between said modulating input signal and the difference in phase between said carrier signal and the output of said subtracting means.

3,996,533

HIGH FREQUENCY, MULTI-THROW SWITCH EMPLOYING HYBRID COUPLERS AND REFLECTION-TYPE PHASE SHIFTERS

Chong W. Lee, 22 Heritage Drive, Lexington, Mass. 02173

Filed July 7, 1975, Ser. No. 593,904
Int. Cl.² H01P 1/10
U.S. Cl. 333—7 R 11 Claims

1. An electrical switch having a plurality of switch terminals

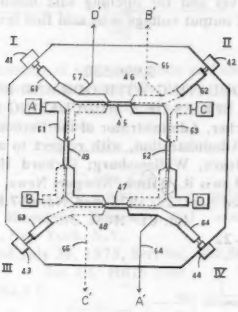
for switching frequency electrical signals fed to the switch terminals between the switch terminals depending upon the electrical state of the switch comprising,

four switch terminals I, II, III and IV,

four hybrid couplers of which two are switch terminal couplers and two are switch internal couplers,

each hybrid coupler having four terminals and each dividing power of a signal fed to any terminal thereof equally between two other terminals thereof,

switch terminals I and II being different terminals of one of said switch terminal couplers,



switch terminals III and IV being different terminals of the other of said switch terminal couplers,

the other terminals of said two switch terminal couplers being connected to terminals of said internal couplers,

at least one controlled phase shifter circuit connected to at least one other internal coupler terminal for intercepting signals issuing therefrom and returning the intercepted signal to the same said internal coupler terminal and

means for controlling said controlled phase shifter circuit to cause a change in the returned, intercepted signal,

whereby said change causes a change in the electrical state of the switch.

3,996,534

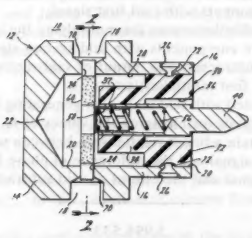
COAXIAL MICROWAVE TERMINATION HAVING ROD-SHAPED RESISTIVE TERMINATION

Helmut Bacher, Point Pleasant, N.J., assignor to Midwest Microwave, Inc., Ann Arbor, Mich.

Filed June 30, 1975, Ser. No. 592,086

Int. Cl.² H01P 1/26

U.S. Cl. 333—22 R **8 Claims**



1. A termination adapted to be connected to a coaxial transmission line having an inner conductor and a coaxially disposed outer conductor to receive energy therefrom in the microwave range for dissipating substantially all of the energy received from the coaxial line, comprising:

an electrically conductive body adapted to be connected to the outer conductor of said transmission line having a bore partially extending along a predetermined axis of said body and having an end wall and a cylindrical side wall defining a closed cavity, said conductive body further having a transverse bore in said cylindrical side wall extending substantially perpendicularly of said predetermined axis into said cavity at a location axially spaced from said end wall of said closed cavity;

a dielectric member having a portion adapted to mate with said bore of said body and having a bore extending along said predetermined axis;

a center conductor adapted to be connected to the inner conductor of said transmission line having a portion adapted to mate with the bore of said dielectric member so that said center conductor is coaxially disposed within said partial bore along said predetermined axis, said center conductor being positioned relative to said partial bore of said body so that said center conductor terminates at an end which extends into said cavity but is spaced from said end wall of said bore; and

a dielectric rod-like member extending substantially perpendicular of said predetermined axis into said closed cavity of said body, said dielectric member having a resistive layer thereon, said dielectric member being disposed in said transverse bore and having said resistive layer thereon in electrical contact with said body at said transverse bore, said dielectric member extending adjacent to said center conductor and having said resistive layer in electrical contact with said center conductor at said end thereof.

3,996,535

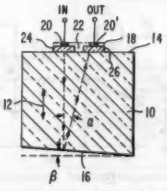
MICROWAVE BULK ACOUSTIC DELAY DEVICE HAVING TWO TRANSDUCERS ON THE SAME SURFACE AND METHOD OF MAKING SAME

Zygmond Turski, Trevose, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,236

Int. Cl.² H03H 9/30; H01L 41/08, 41/18, 41/22

U.S. Cl. 333—30 R **10 Claims**



1. A microwave bulk acoustic delay device comprising:

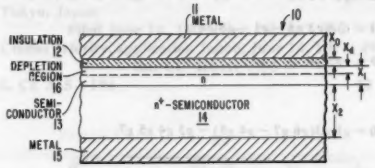
an acoustic delay cubic crystalline substrate of the type having a low loss acoustic wave propagating axis, said substrate having first and second oppositely disposed planar surfaces, and

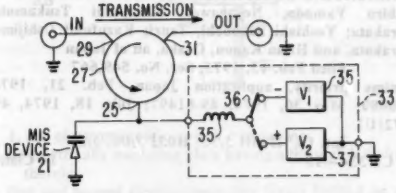
first and second acoustic wave transducers mounted in spaced relationship mechanically and electrically isolated from each other on one of said surfaces, the other of said surfaces being arranged to reflect an acoustic wave generated by one of said transducers directly to the other of said transducers, said transducers being respectively arranged to transmit and receive an electrical periodic signal having a repetition rate at microwave frequencies.

3,996,536
METAL-INSULATOR-SEMICONDUCTOR DEVICE PHASE SHIFTER

Raymond Louis Camisa, Hightstown; Benjamin Franklin Hitch, Somerville, and Shui Yuan, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 20, 1975, Ser. No. 588,763
Int. Cl.² H01P 1/15, 1/18
U.S. Cl. 333—31 R **7 Claims**





1. A phase shifter for microwave signals of high power level comprising:

a metal-insulator-semiconductor device of uniform cross-section with the insulator layer spaced continuously between said metal and said semiconductor layer and having a pair of terminals and characterized by exhibiting a first substantially fixed value of capacitance when biased over a first relatively broad range of D.C. bias voltages in a first direction and by exhibiting a second substantially fixed value of capacitance when biased over a second relatively broad range of D.C. bias voltages in a second reverse direction;

first coupling means coupling the first terminal of said pair to a point of reference, reflecting potential;

second coupling means for coupling said microwave signals to the second terminal of said device and for coupling the signals reflected from said device at said second terminal to an output means; and

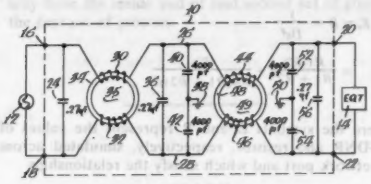
means for biasing said device initially by a D.C. voltage within said first range in said first direction and then by a D.C. voltage within said second range in said second reverse direction, whereby the reflection coefficient phase angle shifts substantially a given amount providing a substantially given amount of phase shift of said microwave signals.

3,996,537
NOISE SUPPRESSION FILTER

Werner E. Neuman, Deerfield, Ill., assignor to Corcom, Inc., Chicago, Ill.

Filed July 21, 1975, Ser. No. 597,319
Int. Cl.² G05F 3/04; H03H 7/00
U.S. Cl. 333—78 **5 Claims**

1. A power line filter for digital equipment and the like which comprises a pair of power transmission lines for delivering alternating current from a source of power to said equipment, a first toroidal core of relatively low permeability, each of said lines being wound on said core to produce aiding fluxes within said core in response to said alternating current, a second toroidal core of substantially greater permeability, each of said lines being wound on said second core to produce

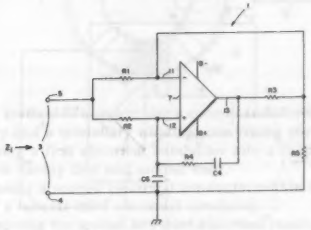


opposing fluxes within said core in response to said alternating current, a capacitive shunt between said lines, and a capacitive shunt between each of said lines and ground.

3,996,538
SINGLE AMPLIFIER NETWORK FOR SIMULATING AN FDNR CIRCUIT

Charles E. Schmidt, Woodside, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 24, 1975, Ser. No. 644,282
Int. Cl.² H03H 7/44
U.S. Cl. 333—80 R **6 Claims**



1. An active one-port network for simulating an FDNR D and a resistor R electrically connected in series across the pair of terminals of the network port, comprising:

a differential-input operational amplifier having first and second input lines electrically connected to associated input terminals of the amplifier which are of opposite polarity and having an output line;

a first resistor R1 electrically connected between one network terminal and said first input line;

a second resistor R2 electrically connected in series between the one network terminal and said second input line;

a third resistor R3 electrically connected between said output line and said first input line;

a first capacitor C4 and a fourth resistor R4 electrically connected in series between said output line and said second input line;

a fifth resistor R5 electrically connected between said first input line and the other network terminal which is also connected to a ground reference potential; and

a second capacitor C6 electrically connected between said second input line and the other network terminal;

normalized values of the capacitances of said capacitors being unity;

normalized values of the the resistances of said resistors satisfying the requirements that

$$R3 = R5$$

and

$$R2\,R5 = R1\,R4,$$

the impedance Z_i looking into the network port satisfying the relationships

$$Z_i = R + \frac{1}{Ds^2}$$

$$= \frac{R1\,R2}{R1 + R2} + \frac{R1}{R4(R1 + R2)s^2}$$

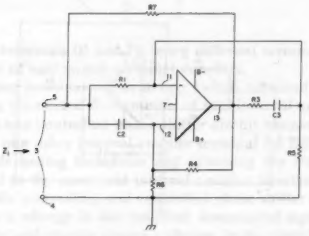
where the symbols D and R represent the values of the FDNR and resistor, respectively, simulated across the network port and which satisfy the relationships

$$R = \frac{R1\,R2}{R1 + R2} \text{ and } D = \frac{R4(R1 + R2)}{R1}$$

3,996,539
SINGLE AMPLIFIER NETWORK FOR SIMULATING A SUPER-INDUCTOR CIRCUIT

Man Shek Lee, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 24, 1975, Ser. No. 644,279
Int. Cl.² H03H 7/44
U.S. Cl. 333—80 R 8 Claims



1. An active, one-port simulation network for simulating a super-inductor X, an inductor L, and a resistor $R = 1/G$ electrically connected in series across the pair of terminals of the network port, comprising:

a differential-input operational amplifier having first and second input lines electrically connected to associated input terminals of the amplifier which are of opposite polarity and having an output line;

a resistor R1 electrically connected in series between one network terminal and said first input line;

a capacitor C2 electrically connected between the one network terminal and said second input line;

a resistor R3 and capacitor C3 electrically connected in series between said output line and said first input line;

a resistor R4 electrically connected between said output line and said second input line;

a resistor R5 electrically connected between said first input line and the other network terminal which is connected to a ground reference potential;

a resistor R6 electrically connected between said second input line and the other network terminal;

a resistor R7 electrically connected between said output line and the one network terminal;

normalized values of the capacitance of said capacitors and the resistance of said resistors and said simulated elements satisfying the requirements that

$$C2\,C3(g3\,g6\,g4\,g5\,g7) = 0$$

and

$$C3(g1\,(g3g6 - g4\,g5) + g7(g3\,g6 - g4\,g5 + g1\,g6)) - C2\,g3\,g5(g4 + g7) = 0$$

where g represents the conductance of a particular one of said resistors, the impedance Z_i looking into the network port satisfying the relationships

$$Z_i = s^2X + sL + R$$

where

$$X = a2/b0,\ L = a1/b0, \text{ and } R = a0/b0, \text{ and}$$

$$a2 = g3\ C2C3$$

$$a1 = C3(g3\,g6 - (g1 + g5)g4)$$

$$a0 = -g3\,g4(g1 + g5)$$

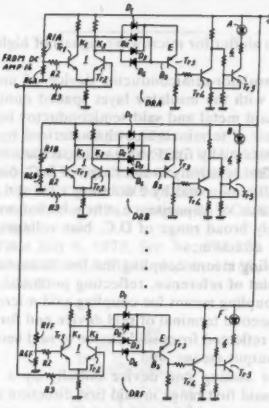
and

$$b0 = g1\,g3(g6\,g7 - g4\,g5) - g3\,g4\,g5\,g7.$$

3,996,540
INDICATING DEVICE FOR TUNING APPARATUS

Yasuhiro Yamada, Neyagawa; Kazuyoshi Tsukamoto, Hirakata; Yoshiaki Sakauchi, Tenri; Kazufumi Ushijima, Hirakata, and Hisao Kanou, Osaka, all of Japan

Filed Feb. 13, 1975, Ser. No. 549,667
Claims priority, application Japan, Feb. 21, 1974, 49-20889; May 30, 1974, 49-61497; July 18, 1974, 49-85972[U]
Int. Cl.² H03H 5/12; H03J 3/06, 5/04
U.S. Cl. 334—15 14 Claims



1. An indicating device for a tuning apparatus, said tuning apparatus comprising

a voltage controlled variable reactance device, and

means for supplying a variable amplitude control voltage to said voltage controlled variable reactance device, said variable control voltage causing changes in reactance device in accordance with the amplitude of said control voltage and thus changes in a tuning frequency of said tuning apparatus for selectively receiving a broadcasting signal of a frequency band, said indicating device comprising:

plurality of frequency region visual indicating means, arranged in succession, for covering said frequency band to be received by said tuner, each visual indicating means corresponding to one of a plurality of frequency regions to which said frequency band is divided, and

means responsive to the amplitude of said variable control voltage for selectively energizing the corresponding one of said plurality of frequency region visual indicating

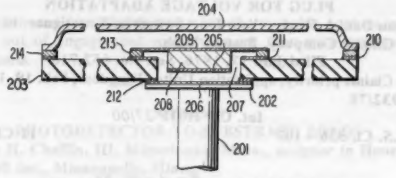
means, the frequency region of which indicating means includes a frequency tuned by said tuning apparatus as a function of the amplitude of said variable control voltage applied to said voltage controlled variable reactance device.

3,996,541

ELECTROMAGNETIC SWITCH

Sadayuki Mitsuhashi, and Kazutoshi Wakamatsu, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,530
Claims priority, application Japan, June 14, 1974, 49-67092
Int. Cl.² H01H 1/06
U.S. Cl. 335—196 13 Claims



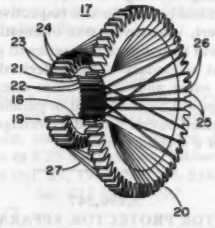
1. An electromagnetic switch comprising:
an electrically insulating plate having a through hole formed therein;
first and second electroconductive layers formed on opposite surfaces of said insulating plate around said through hole; and
an electromagnetic relay including a core member secured to one of said first or second electroconductive layers, a spring member secured to the other of said second or first electroconductive layers, and an armature member attached to said spring member for movement longitudinally within said through hole.

3,996,542

DEFLECTION YOKE HAVING NONRADIAL WINDING DISTRIBUTION

William Henry Barkow, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,967
Int. Cl.² H01F 7/00
U.S. Cl. 335—213 5 Claims



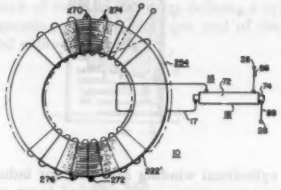
1. A deflection yoke comprising:
a core including an outwardly flared inside surface portion;
a first set of grooves disposed at the front larger diameter portion of the core;
a second set of grooves disposed at the rear smaller diameter portion of the core and extending toward said front along the inside surface portion of said core, said second set of grooves also extending inwardly along said inside surface and lying in radial planes with respect to the central longitudinal axis of the core; and
conductor turns extending from said rear to said front of said core along said inside surface and retained by said grooves at said rear portion of said core to extend nonradially from the inside end of said second set of grooves to the first set of grooves.

3,996,543

CURRENT TRANSFORMER

Edmond E. Conner, Brookfield, Ohio, and James E. Smith, Farrell, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1976, Ser. No. 655,307
Int. Cl.² H01F 27/06, 27/30, 40/06
U.S. Cl. 336—58 9 Claims



1. A method of constructing a current transformer having a primary and a secondary winding, comprising the steps of:
forming a first electrical conductor into a loop configuration having first and second ends,
disposing a second electrical conductor within the opening of a tubular third electrical conductor,
connecting the second and third electrical conductors to the first and second ends, respectively, of the first electrical conductor to form a primary winding and lead assembly,
winding a magnetic strip material to provide a plurality of superposed turns in the form of a ring-shaped core loop having a predetermined build,
cutting the ringshaped core loop across the build at first and second locations 180° apart to form first and second core parts each having a plurality of nested one-half turns of magnetic strip material,
shifting the adjacent ends of the one-half turns in each of the first and second core parts to provide predetermined stepped relationships between the adjacent ends of the one-half turns, with the predetermined stepped relationship at each end of each core part being complementary with the stepped relation at an end of the other core part,
assembling the first and second core parts with the complementary stepped ends cooperating to provide a ring core having first and second stepped-lap joints,
winding a fourth electrical conductor about the build of the assembled ring core to provide the secondary winding, with the fourth electrical conductor passing over each of said first and second stepped-lap joints to provide conductor turns on each core part,
cutting the fourth electrical conductor at each point where it interconnects turns on each core part to enable the ring core to be separated,
separating the first and second core parts,
assembling the first and second core parts about the first electrical conductor, with the complementary stepped ends again cooperating to provide the ring core with the first and second stepped-lap joints,
and electrically connecting the associated cut ends of the fourth electrical conductor to re-establish the integrity of the secondary winding.

3,996,544

CYLINDRICAL WINDING FOR INDUCTION ELECTRICAL APPARATUS

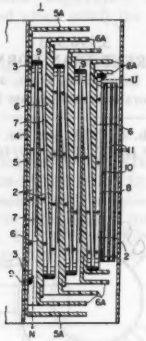
Etsunori Mori; Yoshitake Kashima, and Fumio Nishikawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 18, 1975, Ser. No. 641,931

Claims priority, application Japan, Dec. 23, 1974, 49-146804

Int. Cl.² H01F 27/10

U.S. Cl. 336—60 6 Claims



1. A cylindrical winding assembly for induction electrical apparatus comprising; a plurality of layer windings having different diameters and being arranged concentrically, each of said layer windings including a conductor cylindrically wound, said layer windings being connected in series from the innermost one to the outermost one thereof; and a plurality of layer insulators respectively arranged inside of said plurality of layer windings, each of said layer insulators having at least a flange at an end thereof; an oil gap being formed between each of said layer insulators and one of said layer windings inwardly adjacent to said each layer insulator, said oil gap serving as path of cooling oil, said oil gap having an oil-gap-equivalent part which is formed at the ends thereof where the electric potential difference between adjacent layer windings is greatest and has a greater width than the other parts of said oil gap.

3,996,545

HOLDING ARRANGEMENT FOR A LOW-TEMPERATURE-COOLED ELECTRIC WINDING WITHIN A VACUUM TANK

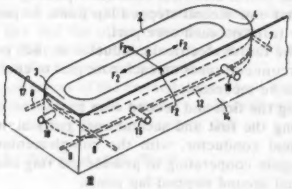
Werner Elsel, Erlangen, and Franz Bohm, Grossgrundlach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1975, Ser. No. 617,171

Claims priority, application Germany, Sept. 30, 1974, 2446716

Int. Cl.² H01F 27/02

U.S. Cl. 336—92 5 Claims



1. A holding arrangement fastening a winding enclosure to a vacuum tank, said enclosure being subject to external forces and housing an electric field winding which is to be cooled to a low temperature, said arrangement comprising:

pressure posts arranged between the enclosure and said tank;

and tie rods unilaterally pulling said enclosure against said pressure posts, said rods being pre-tensioned by a force at room temperature to provide a positive force transmitting contact between said enclosure and said tank via said posts at room temperature, said pre-tensioning force being of such a magnitude that at low temperatures a residual force remains which is at least as large as the component of said external forces opposing it, whereby said positive force transmitting contact is maintained at said low temperature.

3,996,546

PLUG FOR VOLTAGE ADAPTATION

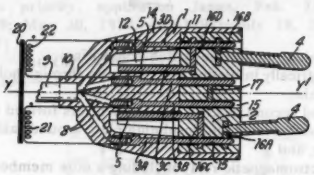
Jean-Daniel Hugly, Yverdon, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Jan. 27, 1976, Ser. No. 652,716

Claims priority, application United Kingdom, Feb. 19, 1975, 6932/75

Int. Cl.² H01F 27/00

U.S. Cl. 336—107 11 Claims



1. A dual-voltage electric plug comprising an insulating hollow casing having an opening, a terminal fitting within the casing, said fitting including four conducting terminal pins extending towards the opening in the casing, which four terminal pins are respectively connected or connectable to four conductors constituting two pairs across which are respectively connected two primary windings of a transformer having a common secondary winding, and an insulating insert insertable into the opening in the casing in either one of two differing orientations, said insert carrying live and neutral projecting socket pins for cooperation with a mains voltage socket, said insert also carrying connecting means located within the casing when the insert is in its inserted condition and for completing differing circuit paths through the socket pins and the terminal pins in the two respective orientations of the inserted insert, whereby in one orientation the two primary windings will be connected in series to provide a predetermined output secondary voltage derived from a mains voltage of one value and in the other orientation the two primary windings will be connected in parallel to provide the same predetermined output secondary voltage derived from a mains voltage of a second value.

3,996,547

MOTOR PROTECTOR APPARATUS

Yoshimitsu Kinjo, Hatogaya, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

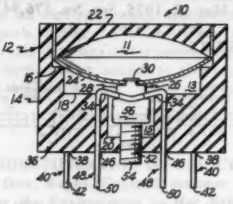
Filed Sept. 5, 1974, Ser. No. 503,222

Int. Cl.² H01H 37/52, 37/28

U.S. Cl. 337—363 8 Claims

1. An apparatus for connecting and disconnecting a circuit comprising a generally open ended cupshaped casing formed of electrically insulative material, the casing having a base and side walls extending therefrom, more than two stationary contacts centrally mounted in the casing, a sole movable contact mounted in the casing, and a snap-action bimetallic

disc secured in the casing with the sole movable contact affixed to the disc, the disc movable between first and second configurations upon thermal energy being applied and dissi-



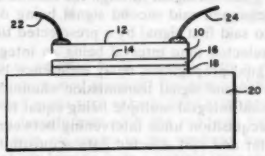
pated to and from the disc to move the movable contact into and out of engagement with the more than two stationary contacts.

3,996,548

PHOTODETECTOR-TO-SUBSTRATE BONDS

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,531
Int. Cl.² H01L *31/08*
U.S. Cl. 338—15 9 Claims



1. A photosensitive device comprising:
a photodetector;
an electrically insulating layer on a surface of the photodetector, the electrically insulating layer being a stable electrically insulating oxide which is wettable by indium;
an electrically conductive substrate; and
a bonding layer between the electrically insulating layer and the electrically conductive substrate for bonding the photodetector to the electrically conductive substrate, the bonding layer being a metal of the group consisting of indium and alloys thereof.

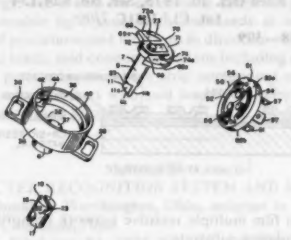
3,996,549

ELECTRICAL CONTROL AND MECHANICAL COUPLING THEREFOR

James N. Hufford, and Wayne A. Barden, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Oct. 21, 1974, Ser. No. 516,749
Int. Cl.² H01C *9/02*
U.S. Cl. 338—127 10 Claims

1. The combination of a variable resistance control and a coupling, the variable resistance control comprising a housing, a dielectric substrate secured to the housing, a resistance path and a collector supported by the substrate and disposed near the periphery of the substrate, the resistance path and collector being disposed substantially the same radius from the center of the substrate, a driver rotatably supported by the housing, a contactor constrained to rotate with the driver in engagement with the resistance path and the collector, the contactor having a first elongated resilient contact finger extending along the periphery of the driver and engaging the resistance path and a second elongated resilient contact finger extending along the periphery of the driver opposite the first contact finger and engaging the collector, a shaft connected to the driver, and a tongue extending from the shaft, the coupling comprising a first arcuate jaw, a second arcuate jaw disposed



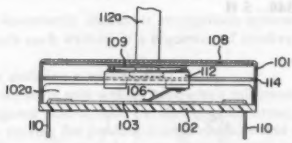
opposite the first arcuate jaw, the first and second arcuate jaws defining a slot and engaging the tongue, and an arm connected to each of the jaws, the arms defining a cylindrical cavity communicating with the slot, one end of the tongue being suspended within the cavity.

3,996,550

SLIDABLE VARIABLE RESISTOR OF ELECTRIC SHOCK PREVENTION TYPE

Tadashi Yano, Katano, and Shozo Watanabe, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 29, 1975, Ser. No. 644,904
Claims priority, application Japan, Oct. 1, 1975, 50-6429[U]
Int. Cl.² H01C *10/06, 10/38*
U.S. Cl. 338—183 3 Claims



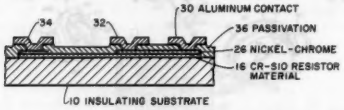
1. A slidable variable resistor comprising:
an upper cover having a cross section of U-shape being placed upside down and having a rectangular opening at the top of said upper cover;
a lower case member of insulating material being placed underside of said upper cover;
a resistor member and a conductor member disposed on said lower case member;
a sliding member of insulating material having a brush making contact with said resistor member and said conductor member, and connecting said resistor and conductor members, being slidably disposed between said upper cover and said lower case member, and having an arm projecting through said opening at the top of said upper cover; and
an insulating flat plate having a length about equal to the inside length of said upper cover, and a width wider than the width of said rectangular opening at the top of said upper cover and less than the width of a passage lying in the axial direction within said sliding member, slidably disposed in a passage in said sliding member in parallel with the top of said upper cover.

3,996,551

CHROMIUM-SILICON OXIDE THIN FILM RESISTORS

Eddie B. Croson, Ojai, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 624,134
Int. Cl.² H01C 7/00
U.S. Cl. 338—309 2 Claims



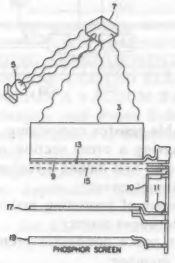
1. A thin film multiple resistive network comprising:
a. an insulating substrate;
b. a film of chromium-silicon oxide deposited on said substrate;
c. a layer of nickel-chrome over said film of chromium-silicon oxide in preselected areas;
d. electrical connectors attached to said layer of nickel-chrome;
e. wherein said nickel-chrome layer forms a closed circuit between at least two of said electrical connectors.

3,996,552

DEVICE FOR PROVIDING A HOLOGRAM OF AN INSONIFIED OBJECT

William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Apr. 28, 1975, Ser. No. 572,259
Int. Cl.² G01S 9/66; H01J 31/495
U.S. Cl. 340—5 H 22 Claims



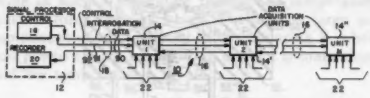
1. A device for converting acoustic radiation from a source which is reflected from an object into a hologram, comprising a piezoelectric transducer for receiving the reflected acoustic radiation and providing an electronic charge pattern corresponding thereto, a source of electrons associated with the piezoelectric transducer for providing a spatial electron current modulated by the electronic charge pattern, means for biasing the electron current in a linear region of the cathode current-grid voltage curve, and means for modulating the biased electron current by a reference voltage of fixed phase relative to the acoustic source to provide a spatial electron current having a component corresponding to the hologram of the object.

3,996,553

SEISMIC DATA TELEMETERING SYSTEM

Lee E. Siems, and Paul M. Morgan, both of Houston, Tex., assignors to Western Geophysical Company of America, Houston, Tex.

Filed May 12, 1975, Ser. No. 576,943
Int. Cl.² G01V 1/22
U.S. Cl. 340—15.5 TS 17 Claims



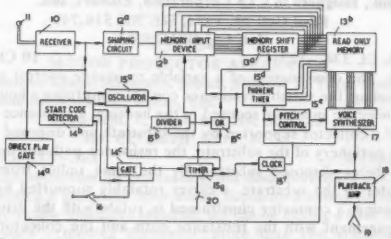
1. A system for initiating a desired switching action in a selected one of a plurality of substantially identical, multiple input, seismic data acquisition units that are interchangeable without adjustment, spaced apart from one another by a substantial distance and in a constructive order in a known relationship to each other, comprising:
a control means located remotely with respect to said data acquisition units;
first and second transmission channels linking the control means with each one of said acquisition units, the signal propagation velocity in the first channel being less than the signal propagation velocity in the second channel;
a switching means in each acquisition unit;
a signal transmitter in said control means to transmit a first signal through the first signal transmission channel and to transmit a second signal through the second signal transmission channel, said second signal being delayed with respect to said first signal by a preselected time interval, said preselected time interval being an integral multiple of the signal propagation delay difference between said first and second signal transmission channels the multiplier of said integral multiple being equal to the number of data acquisition units intervening between said signal transmitter and said selected data acquisition unit; and
signal coincidence detector means coupling said first and second signal transmission channels with said switching means, said detector means initiating the desired switching action when the first signal and the delayed second signal reach the selected acquisition unit substantially simultaneously.

3,996,554

DATA TRANSMISSION SYSTEM

Andrew Peter Ives, Knowle, and Duncan Barry Hodgson, Whitnash, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 19, 1974, Ser. No. 452,653
Claims priority, application United Kingdom, Apr. 26, 1973, 19825/73
Int. Cl.² G06G 1/00
U.S. Cl. 340—33 2 Claims



1. A data transmission system comprising a receiver

mounted on a road vehicle, an aerial coupled to the receiver for receiving data signals radiated from an external transmitter having an inductive loop positioned along the path of travel of the road vehicle to enable transmission of data signals to the receiver, a memory unit connected electrically to said receiver for storing data signals received by the aerial at a relatively fast rate, and an electrical voice synthesizer to which said store data signals are fed at a relatively slow rate and which is responsive to said data signals for converting said data signals directly into human voice sounds to give oral information to the driver of the road vehicle.

3,996,555

IDENTIFICATION OF VEHICLES

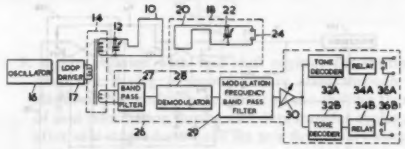
Ian Malcolm Dow, Rugby, England, assignor to The Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sept. 9, 1975, Ser. No. 611,740

Claims priority, application United Kingdom, Sept. 17, 1974, 40367/74

Int. Cl.² G08C *1/00*; H04B *5/00*

U.S. Cl. 340—38 L **21 Claims**



1. A vehicle adapted to cooperate with a roadway loop having a predetermined resonant frequency, said vehicle having an insulated multi-turn vehicle loop arranged on the vehicle to form a transformer with the roadway loop when said vehicle loop is in proximity to the roadway loop; means for tuning the vehicle loop to form a vehicle loop circuit resonant at a first frequency which is substantially the resonant frequency of the roadway loop; and means for modulating the vehicle loop circuit at a second frequency; different from said first frequency whereby, when said loops are in proximity to one another, a signal modulated at said second frequency is induced from the vehicle loop into said roadway loop for the identification of said vehicle.

3,996,556

LIGHT EMITTING MARKER FOR ROADWAY PAVEMENTS, FOR TRAFFIC SAFETY

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,755

Claims priority, application Italy, Apr. 9, 1973, 22751/73; June 28, 1973, 25989/73

Int. Cl.² E01F *9/00*

U.S. Cl. 340—117 **6 Claims**

1. In a roadway surface marking tape material, a composite tape structure comprising a base strip component superimposed and firmly secured to a roadway surface to form a traffic aid thereon and having an upper face; a plurality of protrusions distributed lengthwise along said upper face at any of a plurality of predetermined locations thereof; means of emitting light comprised of electrically actuable light sources in said protrusions for signalling said predetermined locations of said protrusions to a user; a pair of elongated strip-shaped leads in said composite tape structure for electrically connecting said electrically actuable light sources to a supply of electrical energy; and means for electrically connecting said electrically actuable light sources to said leads at any of said plurality of predetermined locations in direction of the elongation of said leads, said connecting means including conductive spikes for puncturing said base strip component and making direct electrical contact with said leads at a selected one of said predetermined locations.

3,996,557

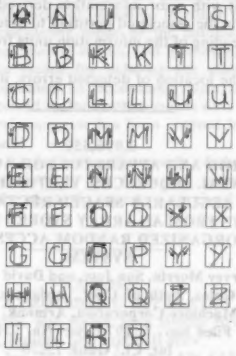
CHARACTER RECOGNITION SYSTEM AND METHOD

Alvin V. Donahey, Worthington, Ohio, assignor to MI² Corporation, Columbus, Ohio

Filed Jan. 14, 1975, Ser. No. 540,798

Int. Cl.² G06K *9/12*

U.S. Cl. 340—146.3 SY **20 Claims**



1. An alphanumeric character recognition system for analyzing symbols each written in a sequence of strokes comprising:

means for defining a writing area,

means to separate said writing area into a minimum number of elongated side-by-side parallel contact areas,

means for storing for predetermined symbols said sequence of strokes as to the respective side-by-side areas contacted,

writing means for writing symbols in said writing area,

said writing means connected to said storing means to feed thereto said sequence of strokes contacting said side-by-side parallel areas when a symbol is being written,

comparison means for comparing said stored sequence of strokes of said predetermined symbols with said written sequence of strokes,

and utilization means having the output of said comparison means connected thereto.

3,996,558

ERROR DETECTION AND RECOVERY FROM MAGNETIC TAPE

Kenneth D. Heun, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 5, 1975, Ser. No. 584,081

Int. Cl.² G06F *11/10*; G06K *5/00*

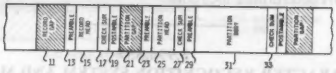
U.S. Cl. 340—146.1 AJ **3 Claims**

1. A method of recovering from errors in the reading of data

and program line blocks of information units from a storage medium, said method comprising:

segmenting the blocks of information units into partitions on the storage medium, each partition containing a predetermined number of information units, said number being determined independently of the length of any particular block of information and depending only on whether said particular information units represent data or program lines;

associating a check information unit with each partition on the storage medium;



reading the information units from a partition on the storage medium into an electronic calculating machine;

reading the check information unit associated with the partition into said electronic calculating machine;

comparing the information contained in the check information unit with error information derived from the information in the associated partition to detect errors, if any, in the reading of the information units from the partition; and

marking the location of detected errors, if any.

3,996,559

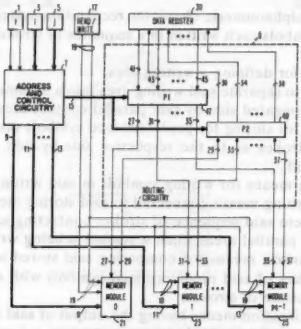
METHOD AND APPARATUS FOR ACCESSING HORIZONTAL SEQUENCES, VERTICAL SEQUENCES AND REGULARLY SPACED RECTANGULAR SUBARRAYS FROM AN ARRAY STORED IN A MODIFIED WORD ORGANIZED RANDOM ACCESS MEMORY SYSTEM

Thomas Harvey Morrin, San Jose, and David Curtis Van Voorhis, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,606

Int. Cl.² G06F *15/20*

U.S. Cl. 340—146.3 MA **6 Claims**



APPARATUS FOR ACCESSING MODIFIED WORD ORGANIZED RAM

1. A word organized random access memory system modified for image processing operations so that the memory system can store an image array comprising a predetermined number rpsq of image points arranged in a predetermined number rp of rows with a predetermined number sq of image points in each row, and modified so that every $1 \times pq$ subarray, every $pq \times 1$ subarray and every regularly spaced $p \times q$ subarray of the $rp \times sq$ image array can be accessed in a single memory cycle, the system comprising:

memory means (21, 23, 25) for storing rpsq image points in the cells of pq different memory modules, each memory module being an entity capable of storing rs image points in distinguishable cells, only one cell of each module being accessible at any single instant of time;

means (1, 3, 5) for selectively designating, from all $1 \times pq$ subarrays, all $pq \times 1$ subarrays and all regularly spaced $p \times q$ subarrays stored in said memory means, which subarray is to be accessed; and

accessing means (7, 47, 39, 49) responsive to said designating means for causing each image point in the designated subarray to be selectively read from or written into a predetermined cell of a predetermined memory module so that the entire designated subarray is accessed in a single memory cycle.

3,996,560

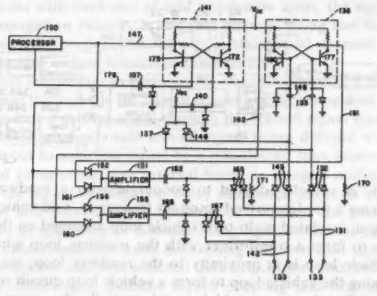
SEQUENCING UNIT

Frederick G. Heath, Edinburgh, Scotland; Charles W. Rose, and Edward L. Glaser, both of Cleveland Heights, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed May 16, 1974, Ser. No. 578,306

Int. Cl.² H04Q *9/00*; H03K *19/08*; G06F *3/00*

U.S. Cl. 340—147 P **10 Claims**



1. An apparatus for the automatic sequencing of a process comprising:

a processor capable of performing a process step upon activation, and of providing a signal upon completion of the step;

a plurality of control cells;

means for inserting a predetermined electrical signal representation of a binary value into each control cell;

an operator connecting the processor and selected ones of said control cells, the operator activating the processor upon receipt of a predetermined group of binary values from the selected control cells, and

means for complementing the values in selected ones of said selected control cells upon receipt of the completion signal from the processor.

3,996,561

PRIORITY DETERMINATION APPARATUS FOR SERIALLY COUPLED PERIPHERAL INTERFACES IN A DATA PROCESSING SYSTEM

Krzysztof Kowal, Framingham, and Leon S. Malone, Jr., Franklin, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 23, 1974, Ser. No. 463,336

Int. Cl.² G06F *3/04*

U.S. Cl. 340—172.5 **14 Claims**

1. Priority determination apparatus for a data processing system comprising:

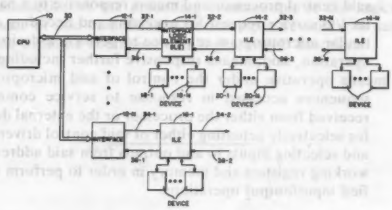
A. a data processor;

B. a plurality of serially coupled peripheral interface logic elements, each having an element address, a first of said

elements coupled with said processor for receiving information serial by bit from said processor, and the remaining ones of said elements coupled with each other to receive said information serial by bit in a daisy chained arrangement from the preceding one of said elements, said information being transferred in data transfer cycles;

C. wherein each of said interface logic elements includes

1. a shift register coupled by means of the element in which such shift register is included, for receiving said information, said shift register including a plurality of stages, each having a different number assigned thereto;
2. means for setting said stages to a first binary state prior to the shifing therein of said information during said data transfer cycles;



3. means coupled with said shift register for shifting a mark bit having a second binary state through the stages of said shift register prior to the shifting therein of said information during said data transfer cycles and after said stages have been set to a first binary state by said means for setting;
4. means for providing the element address of the respective element; and
5. comparator means, coupled with each of said stages of said shift register and coupled to receive the respective element address, for generating a priority signal when said element address compares with the number of that stage of said shift register which includes said mark bit therein.

3,996,562

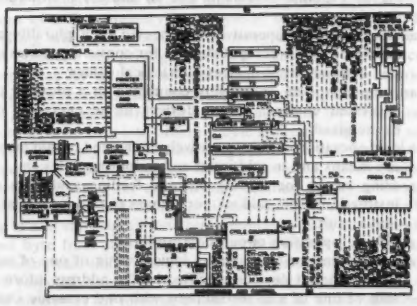
PROGRAMMABLE ELECTRONIC CALCULATOR FOR EVALUATING MATHEMATICAL PROBLEMS

Roy W. Reach, Sudbury; William M. Kahn, Brighton, and David Shapiro, Lincoln, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 378,221, June 26, 1964, abandoned. This application Aug. 22, 1973, Ser. No. 390,645

Int. Cl.² G06F *7/38*

U.S. Cl. 340—172.5 **6 Claims**



1. A program controlled electronic calculator comprising:

manually operable selection means for selectively conditioning the calculator to operate either in a manually controlled calculating mode, a program storing mode, and an automatic program controlled calculating mode;

control means for sequentially receiving algebraic operators;

storage means for storing numerical operands and for storing a program of algebraic operators;

a set of manually operable numeric keys for entering numerical operands into the storage means;

a set of manually operable control keys for entering algebraic operators into the control means when the calculator is conditioned for operation in the manually controlled calculating mode and for entering algebraic operators into the storage means when the calculator is conditioned for operation in the program storing mode;

transfer means for automatically sequentially transferring algebraic operators of a previously stored program from the storage means to the control means when the calculator is conditioned for operation in the automatic program controlled calculating mode;

processing means for combining numerical operands stored in the storage means in accordance with the algebraic operators received by the control means when the calculator is conditioned for operation in either the manually controlled calculating mode or the automatic program controlled calculating mode, said processing means including logic means for delaying the combination of numerical operands in accordance with an algebraic operator received by the control means until at least one other algebraic operator has been entered into the control means; and

output means for indicating the result of the numerical operands combined by the processing means in accordance with the algebraic operators received by the control means.

3,996,563

DATA PROCESSING APPARATUS

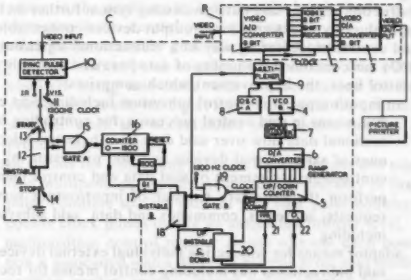
Peter Erskine Baylis, and Ralph John Howell Brush, both of The University, Dundee, Scotland DDI 4HN

Filed Jan. 25, 1974, Ser. No. 436,643

Claims priority, application United Kingdom, Feb. 2, 1973, 5302/73

Int. Cl.² G06F *1/00*

U.S. Cl. 340—172.5 **11 Claims**



1. Apparatus for producing from a data signal representing a first picture form a picture in a second desired picture form which is different from the first picture form and has a predetermined non-linear relationship with said first picture form, said apparatus comprising redistribution means for receiving the data signal, sampling means of the redistribution means for obtaining from the data signal the data to be produced in digital form, and an output of the redistribution means for supplying the sampled data, means connected to the output of

the redistribution means and arranged to produce said second picture form in accordance with data from the output of the redistribution means, means connected to the redistribution means for controlling the redistribution means and produced by the output of said latter means, a voltage controlled oscillator, a shaping circuit connected to the voltage controlled oscillator and prearranged to suppiy a nonlinear voltage characteristic to the voltage controlled oscillator so that the latter produces a control signal whose frequency is varied with time in accordance with said non-linear voltage characteristic, the voltage controlled oscillator being connected to said sampling means to supply said control signal to the sampling means to control the rate of sampling so as to cause the distribution of data produced at the output of the redistribution means to differ in a predetermined non-linear way from the distribution of the data in the data signal received by the redistribution means, to produce said predetermined non-linear relationship between said first picture form represented by said data signal and said second picture form represented by said data from the output of the redistribution means.

3,996,564

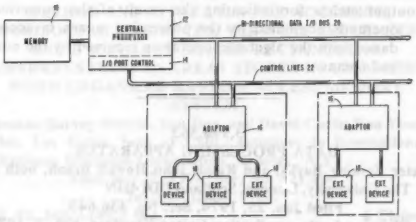
INPUT/OUTPUT PORT CONTROL

Michael Kerrigan, Wappingers Falls, N.Y.; Gerald Lebizay, Nice, France; Olin Lowe MacSorley, Lake Katrine, and Alfred Weiss, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1974, Ser. No. 483,464

Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **2 Claims**



1. In a data processing system including a central processor having an addressable read/write memory, a plurality of addressable working registers, an arithmetic and logical processing unit, a first internal bus, a second internal bus, and an instruction register said data processing system further including a plurality of external input/output devices connectable to said central processor by way of a bidirectional input/output (I/O) bus containing a plurality of data lines and a plurality of control lines, the improvement which comprises:

an input/output port control subsystem including port control means in said central processor, for controlling bidirectional data flow over said data lines between selected ones of said external devices and said processor, by the controllable assignment of said data and control lines to perform the necessary transfer of input/output service requests, addresses, commands and data, said subsystem including

adaptor means for connecting individual external devices to said bidirectional bus including control means for receiving device commands from the port control means and for transferring said commands between said external devices and said port control means,

said adaptor means further including a first command word register means for storing lower priority commands utilized for controlling the operation of said external devices and a second command word register means for storing commands to be transferred to said central processor on a high priority basis, means for initiating a high priority microprogram sequence in response to a command in said second command word register, for sequentially gating a predetermined block of data between said central processor and a particular external device without checking for pending service requests between each read transfer operation and means for returning control to normal interrupt procedures upon the completion of the transmission of said block of data;

said port control means further including a first control driver gate means for selectively connecting said I/O data lines to said first internal bus to effect a data transfer in a first direction,

a second control driver gate means for selectively connecting said I/O data lines to said second internal bus to effect data transfer in the opposite direction,

microprogram sequence control means including a series of selectively accessible microprogram sequences stored in said central processor and means responsive to a particular I/O service request for accessing and decoding a particular microprogram sequence to perform a desired I/O operation, said, means responsive further including,

means operative under the control of said microprogram sequences accessed in response to service commands received from either the processor or the external devices for selectively actuating either of said control driver gates and selecting inputs to and outputs from said addressable working registers and memory in order to perform specified input/output operations.

3,996,565

PROGRAMMABLE SEQUENCE CONTROLLER

Hisaji Nakao, Toyota; Yasufumi Tokura; Toshihiko Yomogida, both of Kariya, and Kazuo Matsuura, Chiryu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha and Toyoda Jidosha Kogyo Kabushiki Kaisha, both of, Japan

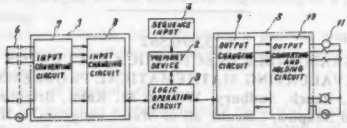
Filed July 3, 1974, Ser. No. 485,575

Claims priority, application Japan, Apr. 19, 1974, 49-44626; Apr. 19, 1974, 49-44627

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² G05B *11/32*

U.S. Cl. 340—172.5 **7 Claims**



1. A programmable sequence controller comprising:

memory means for memorizing a sequence program comprising a train of instructions identified respectively by memory addresses thereof, each of said instructions having an examine command and an address information therein;

an input module operatively connected to a plurality of addressed external input devices for converting states of said external input devices into logical values;

an output module operatively connected to a plurality of addressed external output devices to be energized or deenergized;

a logic operation circuit operatively connected to said memory means and to said input and output modules;

reading means for reading out and feeding said train of instructions from said memory means to said logic operation circuit;

said logic operation circuit comprising:

circuit means for examining a logical value of one of said external input devices specified by the address information of one of said instructions with one examine command of said one of said instructions read out by said reading means;

second memory means for temporarily memorizing an examined result of said circuit means;

said output module being operable to energize or deenergize one of said addressed external output devices in response to an output of said second memory means; and

discontinuance means operatively connected to said second memory means for causing said circuit means to discontinue a next examination of a logical value of another of said external input devices specified by the address information of another of said instructions with another examine command of said another of said instructions read out by said reading means to execute a logic operation nonsequentially when said second memory means memorizes satisfaction of the preceding examination of the logical value of said one of said external input devices with said one examine command of a logical OR function or unsatisfaction of the preceding examination of the logical value of said one of said external input devices with said one examine command of a logical AND function.

3,996,566
SHIFT AND ROTATE CIRCUIT FOR A DATA PROCESSOR

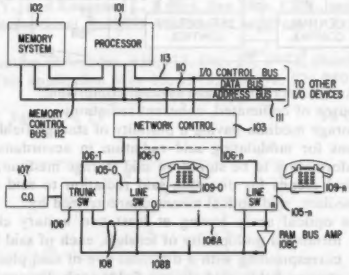
John Christian Moran, Broomfield, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1974, Ser. No. 533,454

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.[2] **G06F** *7/00, 13/00;* **G11C** *19/00*

U.S. Cl. 340—172.5 **22 Claims**



1. In a processor in which a word comprising a plurality of bytes is received and written into different byte address locations of a first memory on a byte-by-byte basis, means for shifting said word in said first memory a specified number of bit positions comprising: a second memory, a shift circuit connected to outputs of said first and second memories, means for receiving shift information specifying the number of bit positions said word is to be shifted, means for writing said word byte-by-byte into different byte address locations of said second memory in a specified byte order with said order being specified by said received shift information, means subsequently effective for concurrently reading the bytes of said word in both of said memories consecutively, means for applying to said shift circuit data bits comprising each concurrently read byte from said first and second memories, and means including said shift circuit controlled by said shift information and responsive to said concurrently received data bits from said memories for forming a new plural byte word representing said received word shifted said specified number of bit positions.

3,996,567
APPARATUS FOR INDICATING ABNORMAL PROGRAM EXECUTION IN A PROCESS CONTROLLING COMPUTER OPERATING IN REAL TIME ON DIFFERENT PRIORITY LEVELS

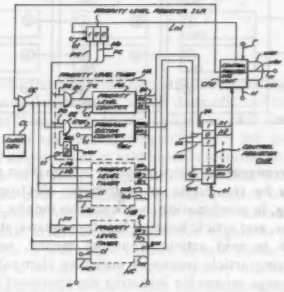
Oleg Avsan, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 535,292, Dec. 23, 1974, which is a continuation of Ser. No. 355,417, April 30, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,621

Claims priority, application Sweden, May 23, 1972, 6661/72

Int. Cl.[2] **G06F** *9/18*

U.S. Cl. 340—172.5 **3 Claims**



1. Apparatus for use with a process controlling computer having a central processing unit and operating in real time on different priority levels which consist of a number of program sectors to indicate to such computer that it is spending greater than a predetermined time at least on one of the priority levels, said apparatus comprising:

a first multiposition register means wherein each position is assigned to a different one of the priority levels, said register means being adapted to receive signals from the central processing unit for establishing predetermined states in the positions to indicate which priority level is operative in the central processing unit,

a clock pulse means for generating clock pulses,

a plurality of first pulse counters, each of said first pulse counters being associated with a different one of the priority levels and having at least one output for emitting a signal when the accumulated pulse count reaches a predetermined value,

logic means for connecting said clock pulse means and said first multiposition register means to said plurality of first pulse counters so that each of said first pulse counters counts clock pulses during its associated priority level,

a multiposition control register means wherein each position is associated with a different priority level, said multiposition control register means being adapted to emit indicator signals to the central processing unit in accordance with which ones of its positions are in a particular state, each of said positions having an input for receiving a signal and in response thereto assuming said particular state,

and connecting means for connecting the outputs of each of said first pulse counters associated with the different priority levels to the positions of said control register means associated with the corresponding priority levels.

3,996,568

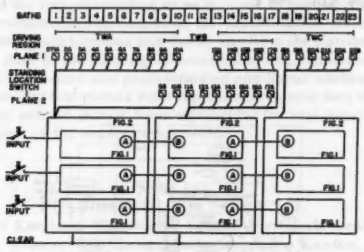
ARRANGEMENT FOR PROCESSING INFORMATION ON GOODS IN PROCESS IN AN AUTOMATIC ELECTROPLATING PLANT

Karl-Heinz Sturm, Berlin; Rudolf Kreisel, and Egon Hubel, both of Nurnberg, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Continuation-in-part of Ser. No. 360,035, May 14, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,418

Int. Cl.² C25D *21/12, 17/28;* **B65G** *47/22;* **G06F** *15/46*

U.S. Cl. 340—172.5 **6 Claims**



1. An arrangement for processing information pertaining to articles to be treated in an automatic electroplating plant comprising, in combination, work station means; article transport means, and article holding location means; storage means connected to said article transport means, said transport means having article transport initiating elements connected to said storage means for initiating the transport of an article; means for connecting said storage means to said article holding location means, said storage means having storage units connected to said transport means and to said article holding location means, and means for inserting into predetermined storage units information pertaining to articles treated; said information in said storage means directing the transport of articles to be treated by said transport means between said work station means and said holding location means, said storage means comprising storage elements within a digital computer.

3,996,569

INFORMATION STORAGE SYSTEMS AND INPUT STAGES THEREFOR

Robert John Dowrick Saunders, Great Bookham, England, assignor to The British Food Manufacturing Industries Research Associated, Leatherhead, Great Britain

Continuation-in-part of Ser. No. 462,577, April 19, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,836

Claims priority, application United Kingdom, Apr. 19, 1973, 19300/73

Int. Cl.² G11C *13/00*

U.S. Cl. 340—173 R **16 Claims**

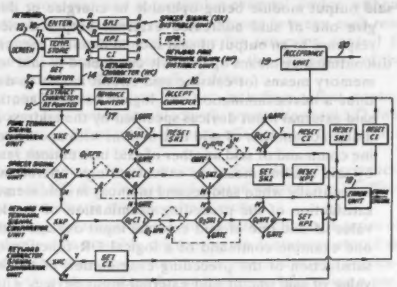
1. An input stage for use in an information storage system comprising:

a. means operable to enter into said input stage an address comprising separately identifiable keyword character signals, a spacer signal and a terminal signal,

b. reading means operable to read the entered address sequentially in steps,

c. comparison means connected to said reading means and operable to separately identify said separately identifiable address signals and produce a corresponding separate match signal, and

d. gate means responsive to said separate match signals occurring in the sequence of a match signal representing identification of a key word character signal, a match signal representing identification of a spacer signal, a match signal representing identification of a keyword character signal and a match signal representing identification of a terminal signal to signal acceptance of said address.



3,996,570

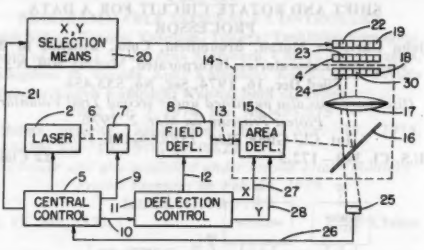
OPTICAL MASS MEMORY

Donald L. Roberts, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1975, Ser. No. 601,243

Int. Cl.² G11C *13/04;* **G06K** *7/10;* **G02B** *5/23*

U.S. Cl. 340—173 LM **15 Claims**



1. An information storage system, comprising:

a source of collimated, coherent radiation;

a storage medium having a plurality of storage fields;

means for modulating said radiation in accordance with information to be stored on said storage medium; and

optical means for directing said radiation to said storage medium, said optical means characterized by

an optical array having at least two unitary elements forming a multiplicity of lenslets, each of said lenslets corresponding with a different one of said plurality of storage fields, said storage fields each disposed in the focal plane of the corresponding lenslet, said optical means further including

first means for directing said radiation to a selected one of said storage fields through said lenslet corresponding with said selected storage field, and

second means for deflecting the radiation to coordinately select discrete storage locations within said selected storage field.

3,996,571

DOUBLE LAYER BUBBLE DOMAIN LATTICE SYSTEM

Hsu Chang, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,308

Int. Cl.² G11C *11/14*

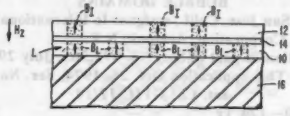
U.S. Cl. 340—174 TF **9 Claims**

1. An apparatus using magnetic bubble domains, comprising:

a first magnetic medium and confinement means for confining domains therein in a two-dimensional lattice of interacting magnetic bubble domains, the interdomain spacings in said lattice being substantially determined by interactions between said domains and by said confinement means,

a second magnetic medium,

means for producing an information bit pattern of bubble domains and voids in said second magnetic medium in positions where said bubble domains in said second mag-



netic medium are magnetically coupled to bubble domains in said first magnetic medium, the spacings between said bits in said second medium being substantially determined by the interdomain spacings in said lattice,

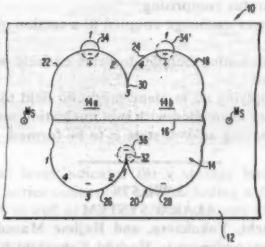
means for moving said bubble domains in said information bit pattern, comprising further means for moving domains in said lattice across said confinement means to thereby move said information bit pattern of domains by said magnetic coupling, and

means for sensing said bubble domains in said second magnetic medium.

3,996,572
VERY HIGH DENSITY GAPLESS PROPAGATION STRUCTURE FOR BUBBLE DOMAINS

George E. Keefe, Montrose; Yeong S. Lin, Mount Kisco, both of N.Y., and Laurence L. Rosier, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 428,972, Dec. 27, 1973, abandoned. This application May 13, 1975, Ser. No. 576,950
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 14 Claims



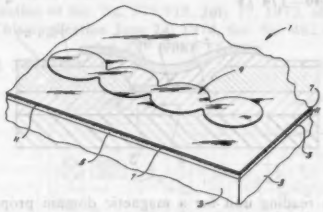
1. A gapless propagation structure for implementing continuous movement of magnetic bubble domains in a supporting material in response to a reorienting in-plane magnetic field, the structure comprising:

a continuous elongated strip of magnetically soft material having opposed longitudinally undulating edges with said undulations in phase, each undulating edge forming a bubble domain propagation path, said undulations being in the form of linked, outwardly convex circular edge portions facing away from each other, and wherein the minimum diameter of each circular edge portion and the minimum lateral distance between opposed longitudinal undulating edges is on the order of four times the diameter of said bubble domains.

3,996,573
BUBBLE PROPAGATION CIRCUITS AND FORMATION THEREOF

Shalendra Kumar Singh, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 21, 1975, Ser. No. 569,626
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 14 Claims

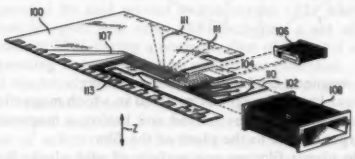


1. A magnetic bubble domain structure comprising: a planar layer of magnetic material in which magnetic bubbles can be moved; and at least one bubble propagation path defined on a major surface of said planar magnetic layer for guiding the movement of said bubbles in said layer in response to a change in orientation of a rotary magnetic field within the plane of said layer, said path including an overlay pattern of magnetically soft material disposed on said major surface of said planar magnetic layer, an ion-implanted region in the upper surface portion of said major surface of said planar magnetic layer forming a border along the periphery of said overlay pattern of magnetically soft material, and the periphery of said overlay pattern of magnetically soft material serving as a bubble-guiding track along said path.

3,996,574
MAGNETIC BUBBLE, FIELD-ACCESS ASSEMBLY

Andrew Henry Bobeck, Chatham; Bruce Hamilton McGahey, South Plainfield, both of N.J.; William Martin Melbert, Jr., Indianapolis, Ind.; Terry Brice Prince, Indianapolis, Ind., and Martin James Stevenson, Indianapolis, Ind., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 470,410, May 16, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,267
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF 16 Claims



1. A magnetic assembly comprising an insulating member including a plurality of electrical conductors imbedded therein, said plurality of conductors being organized in first and second planar arrays, extending through first and second and first and third surfaces of said member respectively, said arrays being joined together to form a support in a first plane orthogonal to the plane of said first surface, said support being adapted to hold a magnetic bubble chip in a cantilevered position in said first plane, and a magnetic chip affixed in said cantilevered position and electrically interconnected to conductors of said first and second arrays.

3,996,575

READING UNIT FOR A MAGNETIC DOMAIN PROPAGATION REGISTER ON A THIN LAYER

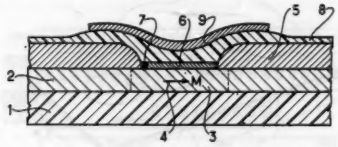
Claude Battarel, Magagnosc, France, assignor to Techniques et Systemes Informatiques, Paris, France

Filed June 9, 1975, Ser. No. 585,414

Claims priority, application France, June 25, 1974, 74.22089

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF 4 Claims



1. In a reading unit for a magnetic domain propagation register on a soft magnetic layer, the improvement wherein; said soft magnetic layer is covered, except at a central point of the unit, by a reading conductor such that said reading conductor is interrupted at said point, a magnetically hard layer covers the soft layer at said point, said hard layer has a permanent orientation which is substantially perpendicular to the easy axis of propagation.

3,996,576

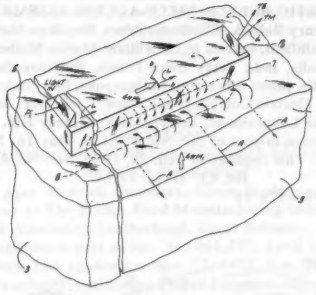
OPTICAL WAVEGUIDE MAGNETIC BUBBLE DETECTION

David Carl Bullock, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 17, 1975, Ser. No. 559,627

Int. Cl.² G11C *11/14, 11/42*

U.S. Cl. 340—174 TF 25 Claims



1. A magnetic bubble detector comprising:

a planar layer of magnetic material in which magnetic bubble domains can be moved and having a magnetization perpendicular to the plane of the film;

a thin planar film on one surface of said planar layer of magnetic material and having a magnetization in the plane of the film at least said thin film defining an optical waveguide for the propagation of linearly polarized light along an axis of the waveguide;

means for coupling linearly polarized light into said waveguide and

means for sensing changes in the polarization mode of the light propagating along the axis of the waveguide, the sensing means including means for coupling light out of said waveguide whereby the movement of a magnetic bubble domain in the layer of magnetic material past said waveguide along a path intersecting with the waveguide and transverse to the axis thereof will modulate the polarized light propagating along the axis of the waveguide by the fringing field of the magnetic bubble domain so as to provide a light output signal from the sensing means therby indicating the passage of a magnetic bubble domain.

3,996,577

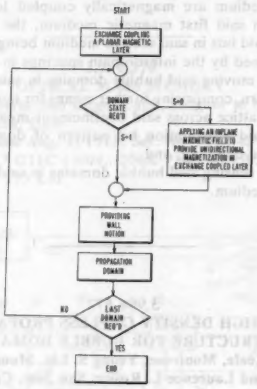
METHOD AND APPARATUS FOR THE CONTROLLED GENERATION OF WALL-ENCODED MAGNETIC BUBBLE DOMAINS

Ta-lin Hsu, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 492,565, July 29, 1974, abandoned. This application Oct. 25, 1974, Ser. No. 517,997

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF 16 Claims



1. Apparatus for selectively generating coded soft bubble domains having a single wall state in a medium supporting bubble domains, said single wall state being $S=1$ in the absence of activation of an in-plane magnetic field, said single wall state being $S=0$ with activation of an in-plane magnetic field, said apparatus comprising,

a magnetic layer exchange coupled to a section of a bubble medium,

means for nucleating bubble domains entirely within said section; and

means for applying an in-plane magnetic field to a portion of said layer associated with said nucleation means when a bubble having an $S=0$ state is to be formed.

3,996,578

ALARM SYSTEM

Takeshi Takeuchi, Yokohama, and Hajime Masuda, Tokyo, both of Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,923

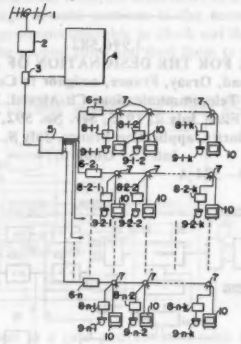
Claims priority, application Japan, Dec. 22, 1972, 47-146584[U]

Int. Cl.² G08B *1/08*

U.S. Cl. 340—416 3 Claims

1. An alarm system for subscribers having locations in group units and utilizing a bidirectional wired television system, and system comprising a plurality of alarm signal generators located at the subscribers locations, said signal generators generating low frequency alarm signals of frequencies common to respective of said group units, said frequencies being different for respective subscribers in respective group units, each of said alarm signal generators being provided for each sub-

scriber; modulators for respective of said group units for modulating the low frequency alarm signals from said alarm signal generators with different high frequency carrier signals; and a receiving panel coupled to said modulators for receiving said modulated alarm signals; said receiving panel including a plurality of demodulators for respective of said group units first bandpass filters corresponding to said high frequency carrier signals utilized for modulation and connected to apply



said modulated alarm signals to said demodulators, first display means connected to said demodulators for respective of said group units, a plurality of second bandpass filters corresponding to the low frequencies for respective of said subscribers, means to supply the outputs of all of said demodulators in common to all of said second bandpass filters, and second display means connected to the outputs of said second bandpass filters for providing second displays for respective of said subscribers.

3,996,579

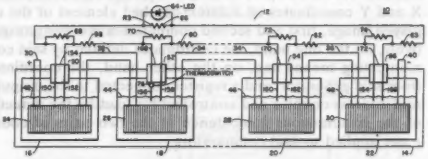
BATTERY ELECTROLYTE LEVEL INDICATOR

Ernest A. Dahl, 3247 Breaker Drive, Ventura, Calif. 93003

Filed Nov. 26, 1975, Ser. No. 635,557

Int. Cl.² G08B *21/00*

U.S. Cl. 340—249 **13 Claims**



1. A fluid level indicator for a storage battery having a plurality of series-connected cells including a first and a second end cell as well as a series of first through nth middle cells comprising:

a. a plurality of probes, one said probe being disposed in each cell of said battery to a depth corresponding to the minimum acceptable level of the electrolyte contained in the cell;

b. a series of first through nth electrical switches, one each being connected to the probe in each said middle cell, said switches being connected in series;

c. signal means connected between said first electrical switch and said probe disposed in said first end cell for providing a signal whenever said electrolyte level falls below said minimum acceptable level in any said cell and whenever the voltage level in any said cell drops below a minimum acceptable level; and

d. current limiting means connected between said nth electrical switch and said probe disposed in said second end cell, said signal means and said electrical switches and said current limiting means and said battery cells forming a complete circuit loop.

3,996,580

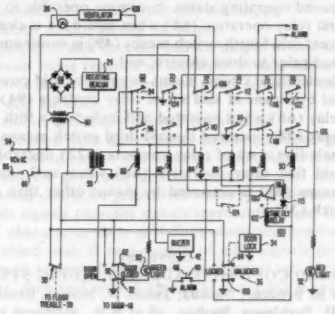
FIRE ALARM AND PROTECTION BOOTH

Vincent Di Paula, Jr., Randallston, and Joseph L. Casseri, Baltimore, both of Md., assignors to Fire Alarm Marketing Corporation, Towson, Md.

Continuation of Ser. No. 379,915, July 17, 1973, abandoned. This application June 24, 1974, Ser. No. 482,422

Int. Cl.² G08B *25/00*

U.S. Cl. 340—304 **18 Claims**



1. A station for signalling an alarm to fire and/or police departments while preventing the possibility of actuating false alarms, as well as providing an emergency refuge, comprising in combination:

a booth type enclosure (10), including a lockable door (18) adapted to detain the person in the enclosure for a predetermined time period after actuating an alarm signal, and additionally including weight responsive means (28) located in the bottom portion of the booth;

first switch means (30) actuable by said weight responsive means (28), second switch means (32) actuated by the opening and closing of said door, an electrical operated door lock (34), third switch means (36) actuated by said door lock, and fourth switch means (49) for actuating an alarm signal;

first electrical circuit means (58) selectively coupled to an electrical power source by the operation of any one of said first, second, and third switch means to provide an electrical power potential;

second electrical circuit means coupled to said power potential and including a first relay (68) coupled to and operated by said second switch means (32) when said door is open, said relay (68) including a set of relay contacts (96) having a normally first of first and second operating states coupled to said power potential;

third electrical circuit means coupled to said power potential by means of said set of relay contacts (96) of said first relay, and including a second electrical relay (74) and a pair of selectively operated contacts (98) having a normally first of first and second operating states, said second relay (74) being operated by the operation of said fourth switch means (49) and said pair of electrical contacts (98) in said first operating state, said second relay additionally including a set of relay contacts (112) having a normally second of first and second operating states coupled to said set of relay contacts (96) of said first relay (68);

said door lock (34) being coupled to said set of contacts (112) of said second relay (74) and being energized upon the operation of said relay contacts (112) to actuate said third switch means (36);

forth electrical circuit means coupled to said power potential by means of said set of relay contacts (112) of said second relay (74) and including a third electrical relay (76) coupled to and operated by the actuation of said third switch means (36) together with the operation of said set of contacts (112) of said second relay, said third relay additionally including a set of relay contacts (116) having a normally second of first and second operating states and becoming operable to signal an alarm upon the operation of said third relay (76); and

fifth electrical circuit means coupled to said power potential by means of said first relay (68) when operated and including a fourth electrical relay (70) operated by said fourth switch means (49) and including a set of relay contacts (104) having a normally second of first and second operating states, becoming operable to hold said first relay operative (68) when said door is closed in the event said fourth switch means (49) is continuously operated prior to door closure; and

sixth electrical circuit means coupled to said power potential by means of said set of relay contacts (94) said first relay (68) when operated and including a fifth electrical relay (78) operated by said third switch means (36) and including a set of relay contacts (122) operable to hold said first relay operative (68) when said third switch means (36) is activated by means other than said door lock (34).

3,996,581

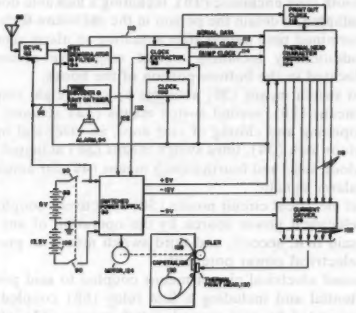
HARD COPY TONE ADDRESS PAGING SYSTEM

Lester R. Brodeur, Nashua; James W. Maben, Brookline, and E. H. Parkinson, Nashua, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed May 22, 1975, Ser. No. 580,076

Int. Cl.² H04M *11/02*; H04B *7/00*

U.S. Cl. 340—311 **7 Claims**



1. A battery operated unit for receiving predetermined sequential tone-coded address signals followed by multitone FSK message signals and for printing out the message after decoding of the address signals comprising in combination:

a body housing a supply of tape, means for imprinting said tape with characters in a print-on-the-fly technique in which there is continuous movement of the tape during printing, means for receiving said signals, means for decoding said predetermined address signals, means for decoding said FSK message signals, and means for actuating said FSK decoding means and said imprinting means to print the decoded message onto said tape responsive to the decoding of said predetermined address;

a cover cooperating with said housing to form a tape channel, a portion of said cover being transparent to permit viewing of the message on said tape in said channel through said cover, whereby said tape need not be removed from said channel for retrieving the information carried thereon;

said address decoding means including normally-off timing circuits each actuated in response to the detection of a different tone and means for sensing when said timing circuits are on in a predetermined sequence and for producing an activation signal for actuating said FSK decoding means and said imprinting means whereby said continuous tape drive and said normally-off circuits contribute to reduce battery drain and extend the life of the pager.

3,996,582

DEVICE FOR THE DESIGNATION OF AN IMAGE

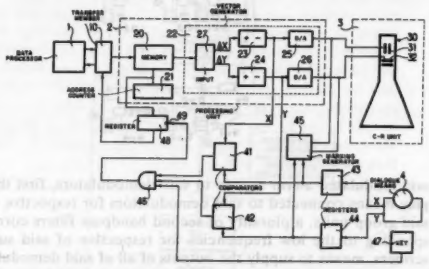
Dusan Sinobad, Orsay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed July 2, 1975, Ser. No. 592,776

Claims priority, application France, July 8, 1974, 74.23645

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 A **2 Claims**



1. A device for designating an element of an image, by the address of the information defining this element, in a display assembly which is controlled by a data processor receiving information that defines the image and which includes a processing unit and a cathode-ray unit having a screen, for converting digital signals received from said processor into suitable voltages for displaying the image; said processing unit including a memory for the image, an address counter for information recorded in said memory, and a vector generator controlled by the latter, said generator producing coordinates of successive elements of the image while refreshed on said screen; the designating device comprising communicating means between an operator and said processor, for furnishing X and Y coordinates of a datum-marked element of the displayed image, first and second comparators receiving respectively, on the one hand, the coordinates defined by said communicating means and, on the other hand, the coordinates from said generator; and a register connected to the output of said address counter and controlled for load by the detection of the simultaneous coincidence of the two pairs of coordinates applied to said comparators.

3,996,583

SYSTEM FOR PROCESSING DATA SIGNALS FOR INSERTION IN TELEVISION SIGNALS

Peter Richard Hutt, Richmond; Alan Ronald Blake, London; Günter Von Cavallar, South Wonston, near Winchester; Brian Neil Douglas, London, and Philip John Dodds, Southampton, all of England, assignors to Independent Broadcasting Authority, London, England

Filed July 30, 1974, Ser. No. 493,109

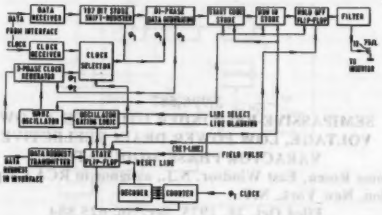
Claims priority, application United Kingdom, July 30, 1973, 36207/73

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 AD **21 Claims**

1. A signal processing system for the compilation and processing of a supply of data signals representing the data for a set of pages of data each for display, separately from the other pages, upon television receiver screens, to provide output

signals for insertion in a transmitted television signal during periods of the transmitted television signal which are unoccupied by video signals, said system comprising a main store for storing the supply of data signals in digitized form, at least one peripheral data generating device for supplying data signals to the main store, a second store having a data storage capacity which is small compared with the storage capacity of the main store, transfer means operable to read out portions of the data signals in digitized form from the main store in a sequence for temporary storage of said portions in the second store, an output, discharge means operable to clock out the portions of the data from the second store and feed them to the output in



series digital form at a rate and at times such that the discharged signals in said series digital form can be accommodated in said television signal during said periods, each said portion representing a part of one of said pages, said sequence being such that the supply of data signals representing the data for the set of pages is transferred to the second store in a repeated cycle, said second store and said discharge means cooperating in order that each portion is fed to the output once only per cycle and means at the output for also providing a clock run-in signal and a start code signal for accommodation in said television signal during said periods and before each said portion.

3,996,584

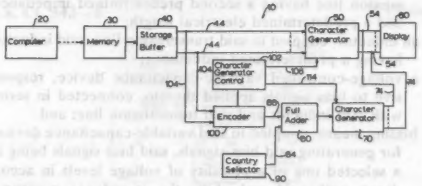
DATA HANDLING SYSTEM HAVING A PLURALITY OF INTERRELATED CHARACTER GENERATORS

Malcolm Plager, Warren, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 352,067, April 16, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,979

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 AD **3 Claims**



1. A data handling and displaying system comprising

a display device for providing a visual display of characters,

a source of data signals to be processed and displayed on said display device, said data signals including signals representing a first set of characters and other signals representing a plurality of different sets of characters,

said source of data signals being coupled to a first circuit path including

a first character generator having an input and an output, said first character generator being adapted to generate electrical display signals representative of a first set of characters,

a connection from said source of data signals to the input of said first character generator, said first character generator having its output coupled to said display device for applying said first set of electrical display signals thereto,

said source of data signals being coupled to a second circuit path including

a second character generator having an input and an output, said second character generator being adapted to generate electrical display signals representative of a plurality of sets of characters different from said first set of characters, the output of said second character generator being coupled to said display device,

a full adder having an input and an output, the output of said full adder being coupled to the input of said second character generator,

an encoder having an input and an output,

a selector circuit having an output,

the output of said encoder and the output of said selector circuit being coupled to the input of said full adder,

a connection from said source of data signals to the input of said encoder,

a character generator control circuit, and

a connection from said encoder to said character generator control circuit and separate connections from said character generator control circuit to said first and second character generators whereby, if said source of data signals provides signals representing said first set of characters, then said first character generator is enabled and, if said source of data signals provides signals representing one of said different sets of characters, then said second character generator is enabled.

3,996,585

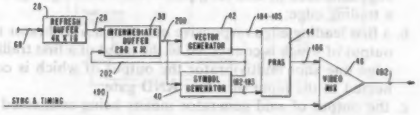
VIDEO GENERATOR CIRCUIT FOR A DYNAMIC DIGITAL TELEVISION DISPLAY

Walter John Hogan, Fairfax, Va., and Alfred Alexander Schwartz, Gaithersburg, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 478,816, June 11, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 653,997

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 AD **20 Claims**



1. A video generator circuit for converting randomly occurring data signals from a host processor, representing graphical patterns into a time sequential video signal for use with a sequentially line scanned display device, wherein the improvement comprises:

an ordered refresh buffer connected to receive said data and adapted to sort said data signals into groups ordered by extremal scan line position for the pattern represented;

an intermediate buffer having a first input connected to the output of said ordered refresh buffer for storing said ordered data signals once during each display field before the display of the pattern represented and outputting said ordered data signals in synchronism with the line scan of the display;

a graphical pattern generator connected to the output of said intermediate buffer for decoding said ordered data signals outputted from said intermediate buffer and generating on a first output line components of the pattern represented which lie along the display line to be scanned;

a partial raster assembly storage connected to said first output line from said graphical pattern generator to store

the components of the pattern represented which lie along the display line to be scanned;

said graphical pattern generator modifiying said decoded ordered data signals to identify the horizontal coordinate for the intersection of said pattern represented with the next display line to be scanned, and outputting said modified data signal over a second output line to a second input line for storage in said intermediate buffer;

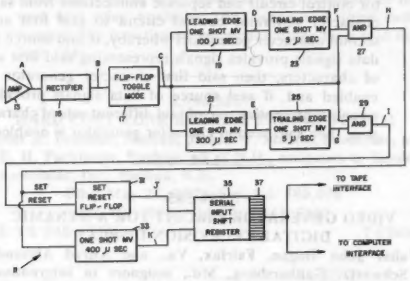
said graphical pattern generator omitting the output of a modified data signal on said second output line when no components of said pattern will intersect succeeding display lines to be scanned in said field.

3,996,586

MAGNETIC TAPE PULSE WIDTH TO DIGITAL CONVERTOR

Walter C. Dillon, and Roderick S. Mesecar, both of Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 508,008
Int. Cl.² G11B 5/09; H03K 13/24
U.S. Cl. 340—347 DD **4 Claims**



1. A translator device for translation of digital information contained in a first format of short pulses and long pulses into a second format signal of pulses and no pulses including:

a. generator means for generating said first format wherein each of said short pulses has a leading edge and a trailing edge and each of said long pulses has a leading edge and a trailing edge;

b. a first leading edge responsive one shot multivibrator the output of which is connected to the input of a first trailing edge one shot multivibrator the output of which is connected to the input of a first AND gate;

c. the output of said generator means being connected to the input of said first leading edge responsive one shot multivibrator and to said first AND gate;

d. a second leading edge responsive one shot multivibrator the output of which is connected to the input of a second trailing edge one shot multivibrator the output of which is connected to the input of a second AND gate;

e. the output of said generator means being connected to the input of said second leading edge responsive one shot multivibrator and to said second AND gate;

f. a set-reset flip-flop device, a one shot multivibrator, and a serial input shift register;

g. the output of said first AND gate being connected to the set input of said set-reset flip-flop device and to the input of said one shot multivibrator;

h. the output of said second AND gate being connected to the reset input of said set-reset flip-flop device;

i. the output of said set-reset flip-flop device and the output of said one shot multivibrator being connected to the inputs of said shift register;

j. said first AND gate provides first clock signals in response to both short and long pulses and said second AND gate provides second clock signals in response to only long pulses; whereby

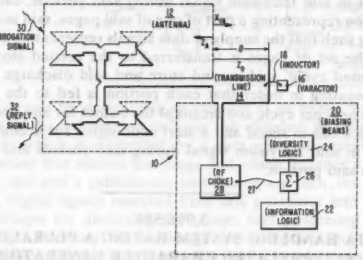
k. said flip-flop device providing an output in response to said first clock signals and no output only during the time duration between the occurrence of said second clock signal and the immediately following first clock signal and said multivibrator interrogating the output of said flip-flop at a predetermined time interval after the occurrence of each of said first clock pulses to determine whether said flip-flop is providing an output or no output.

3,996,587

SEMIPASSIVE RESPONDER UTILIZING A LOW VOLTAGE, LOW POWER DRAIN REFLECTIVE VARACTOR PHASE MODULATOR

Jerome Rosen, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,884
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.8 R **7 Claims**



1. A semipassive responder for generating, in response to incident interrogation signals, a reply signal, said reply signal being shifted in phase in accordance with a sequence of code bits, said responder comprising:

an antenna having a first predetermined impedance;

a transmission line, connected to said antenna, said transmission line having a second predetermined impedance and a predetermined electrical length;

an inductor, coupled to said transmission line, said inductor having a predetermined inductance;

a voltage-controlled variable-capacitance device, responsive to bias signals applied thereto, connected in series with said inductor and said transmission line; and

biasing means, coupled to said variable-capacitance device, for generating said bias signals, said bias signals being at a selected one of a plurality of voltage levels in accordance with said code bits, the impedance measured across said transmission line looking toward said variable-capacitance device being respectively a third predetermined impedance and a fourth predetermined impedance in response to a respective first and second selected ones of said voltage levels;

said first and second predetermined impedances, said predetermined electrical length and said inductance being chosen such that twice the difference between the arctangent of the ratio of said third predetermined impedance to said first predetermined impedance and the arctangent of the ratio of said fourth predetermined impedance to said first predetermined impedance is equal to a predetermined differential phase shift.

3,996,588

SYSTEM FOR AUTOMATIC FREQUENCY CONTROL

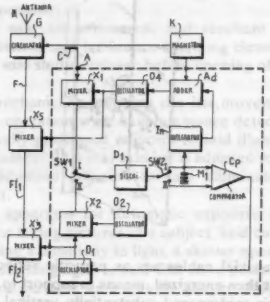
Yves Besson, and Francois Oriol, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 11, 1974, Ser. No. 523,006

Claims priority, application France, June 25, 1974, 74.22066

Int. Cl.² G01S 9/02

U.S. Cl. 343—7 A 15 Claims



1. A system for bringing the frequency of an oscillator under the control of the frequency of the carrier of a pulse, said system comprising means for measuring and storing a parameter characteristic of the carrier frequency value throughout the duration of the pulse, means for measuring the same parameter in respect of the frequency of the oscillator to be controlled, comparing means for comparing, after the pulse, the second measured parameter with the first and stored measured parameter, and control means for controlling the frequency of said oscillator in function of the result of said comparison.

3,996,589

MONOPULSE RADAR SYSTEM

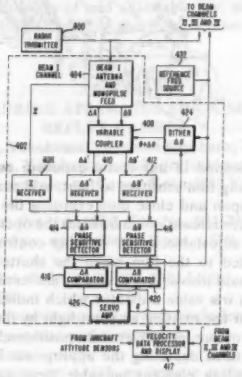
Maurice Earl Breese, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 317,719, Dec. 22, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,702

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² G01S 9/48, 9/22

U.S. Cl. 343—8 4 Claims



2. In a doppler radar system aboard an aircraft of the type employing at least three non-coplanar beam antennas directed towards the ground for receiving return signals from the ground in response to transmitted radar signals and means responsive to said return signals for determining the velocity components of said aircraft with respect to the ground; the improvement wherein said antennas are fixedly mounted, non-track stabilized monopulse antennas having given respective axes with respect to said aircraft, each monopulse antenna simultaneously picking up a respective signal from each member of a set of discrete spaced beam components disposed substantially symmetrically about that antenna's axis, and wherein said system includes axis-rotating means for each of said antennas responsive to said signals picked-up by that antenna which without any mechanical movement of said fixedly mounted, non-track stabilized monopulse antennas in effect rotates its set about its axis to maintain substantially constant at a predetermined value the angular orientation of its set with respect to an isodop on the ground.

3,996,590

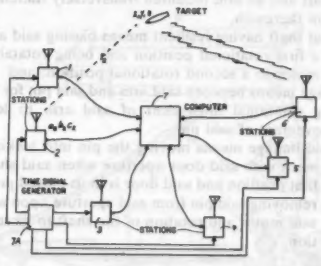
METHOD AND APPARATUS FOR AUTOMATICALLY DETECTING AND TRACKING MOVING OBJECTS AND SIMILAR APPLICATIONS

Calvin Miles Hammack, P.O. Box 304, Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 86,770, Feb. 2, 1961, Pat. No. 3,706,096, and Ser. No. 817,765, April 21, 1969, Pat. No. 3,691,560, and Ser. No. 74,180, Sept. 21, 1970, Pat. No. 3,795,911, and a continuation-in-part of Ser. No. 278,191, May 6, 1963, abandoned, and Ser. No. 288,429, Sept. 12, 1972, Pat. No. 3,866,229. This application Oct. 10, 1972, Ser. No. 296,321

Int. Cl.² G01S 3/02

U.S. Cl. 343—112 R 62 Claims



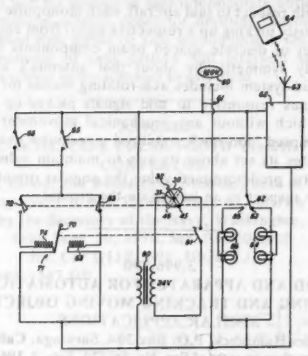
1. A method for the determination of a set of unknown dimensions of the position-motion state, relative to an orthogonal coordinate system, of a moving receiver of waves propagated toward the receiver from at least four transmitting stations fixed on said orthogonal coordinate system at substantial distances from one another, said set of unknown dimensions including the velocity vector and position of said receiver, said receiver comprising but a single wave aperture, each of said transmitting stations comprising only a single wave aperture having a single location and there being only a single wave aperture at each said single location, said method comprising the steps of measuring the doppler effect caused by the motion of the receiver upon the waves arriving at the receiver from each of said transmitting stations, said measurement of the doppler effect performed relative to one transmitting station being substantially simultaneous with the measurement performed relative to each of the other transmitting stations, and each individual measurement being performed relative to waves transmitted from only one such single location, conveying the data resultant from said measurements to a computer and calculating the position and motion of the moving receiver relative to said orthogonal coordinate system from such data.

3,996,591

SECURITY DEVICE FOR GARAGE DOORS

Frank Harold Hayward, R.R. 1, Sherman, Ill. 62684

Filed Oct. 2, 1975, Ser. No. 619,055
Int. Cl.² H04B 7/00
U.S. Cl. 343—225 8 Claims



1. In combination with a door movable in a fixed frame between open and closed positions and a security device comprising a locking pin longitudinally movable between said frame and means forming an aperture in said door, the aperture being registrable with and acceptable said pin in locking engagement therewith when said door is in said closed position,

an electric motor in said security device having an output shaft and an arm mounted transversely thereon for rotation therewith,

said shaft having resilient means biasing said arm toward a first rotational position and being rotatable by said motor to a second rotational position; and

linkage means between said arm and said pin for transforming rotational movement of said arm to longitudinal movement of said pin,

said linkage means moving the pin into locking engagement with said door aperture when said shaft is in its first position and said door is in its closed position, and removing said pin from said aperture upon actuation of said motor and rotation of the shaft to its second position.

3,996,592

ANTENNA WITH ROTATABLE SENSITIVITY PATTERN

Larry H. Kline, Beachwood, and Milosh L. Ukmar, Euclid, both of Ohio, assignors to Orion Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 430,418, Feb. 4, 1965, abandoned. This application Jan. 17, 1974, Ser. No. 434,134
Int. Cl.² H01Q 3/24
U.S. Cl. 343—817 5 Claims

1. An antenna having a rotatable sensitivity pattern and comprising an array of three spaced, substantially vertical, centerfed half wavelength dipole antenna units substantially equidistant from each other by a horizontal distance of substantially 0.15 wavelengths and each having an upper and a lower radiating element separated by a dipole gap, three coaxial cables connected respectively at one end to the antenna units, each of said cables at said one end thereof having an outer conductor connected to one of the radiating elements of the respective antenna unit at one side of the dipole gap and an inner conductor connected to the other radiating element of said antenna unit at the opposite side of the dipole gap, and switching means connected to said coaxial cables at the opposite ends thereof and operable selectively to energize the antenna units one at a time through the respective coaxial cables and to de-energize the two remaining antenna units, each of said coaxial cables having an electrical length such that it constitutes an inductive reactance connected across the dipole gap between the radiating elements of the respective antenna unit when the latter is de-energized by said switching means, whereby the two de-energized antenna units and their

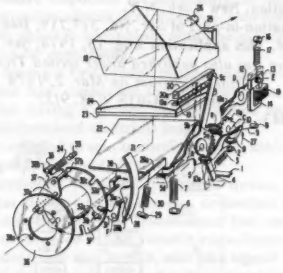
respective coaxial cables act as parasitic reflectors for the antenna unit then energized, means to support to said antenna units in their said spaced substantially vertical position, including substantially vertical mast means having a centerline substantially coinciding with the line defined by the centers of the upper and lower substantially equilateral triangles defined by the upper and lower ends of said dipole antenna units.

3,996,593

EXPOSURE CONTROL DEVICE IN A CAMERA

Naoyuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushika Kaisha, Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,598
Claims priority, application Japan, Oct. 4, 1974, 49-114502
Int. Cl.², G03B 7/12, 17/20
U.S. Cl. 354—43 10 Claims



1. In a method of automatic exposure control for a film camera having film sensitive to light, said camera including a shutter to open and close thus exposing the film to ambient light, a shutter release which initiates the opening action of the shutter, an adjustable iris to variably control the amount of light admitted to the film when the shutter is opened, the opening of said iris varying in size by movement from an initial position, an iris value indicator which indicates the required iris value for the existing ambient light by illuminating one of a plurality of luminous elements positioned adjacent to iris size graduations depicting the appropriate iris sizes, a luminance detecting element movable from an initial position along a path optically adjacent to said luminous elements and operatively connected to said iris for movably adjusting said

iris from an initial value to the size required by the ambient light conditions, an electro-mechanical stopping element operatively connected to both the luminance detecting element and the adjustable iris such that illumination of said luminous detecting element stops said adjustable iris from any further movement, said method comprising the steps of:

moving a luminance detecting element from an initial position and along a path which is in optical cooperation with said luminous elements, said movement being in proportion to the movement of said adjustable iris from said initial position;

initiating said iris movement and resultant coordinated movement of said luminance detecting element by operation of said shutter release before opening of said shutter; and

electro-mechanically stopping the iris movement prior to shutter operation when said luminance detecting element is optically positioned adjacent to said illuminated luminous element such that said iris is adjusted to the value of the graduation adjacent to said illuminated luminous element.

2. In an apparatus for automatic exposure control of a camera when taking pictures of a subject, said camera including film having a sensitivity to light, a shutter operable to open and close admitting light to said film for a period of time, an adjustable iris movable such that the amount of light admitted during shutter operation is controlled by the variable iris opening, a shutter release to initiate the iris adjustment and said shutter operation, a viewfinder to align said camera with said subject such that the image exposed on said film during shutter operation is that of said camera subject, wherein said exposure control apparatus comprises:

an iris value indication means which illuminatingly indicates one iris value among a plurality of iris values, said one iris value being the proper iris value for the camera film exposure based upon said subject brightness;

a luminance detecting means movable along the path of said iris value indication means to optically detect the illuminated iris value and provide a stopping signal upon detecting said illuminated iris element while moving along said path in conjunction with movement of said adjustable iris;

an iris decision means connecting said adjustable iris to said luminance detecting means such that the luminous detecting means moves in proportion to the movement of the adjustable iris;

an electro-mechanical stopping means to stop said adjustable iris upon receipt of a stopping signal;

a luminance amplifier means connected to said luminance detecting means to amplify said stopping signal from said luminance detecting means such that said signal operates said electro-mechanical stopping means and terminates further movement of said adjustable iris, said movement being terminated prior to shutter operation.

3,996,594

LIGHT MEASURING APPARATUS FOR A SINGLE LENS REFLEX CAMERA

Youichi Okuno, Yokohama; Takehiko Kiyohara, Zama; Tokuichi Tsunekawa, Yokohama, and Teiji Hashimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 621,762

Claims priority, application Japan, Oct. 15, 1974, 49-124423

Int. Cl.² G03B 7/00; G01J 1/00

U.S. Cl. 354—56 2 Claims

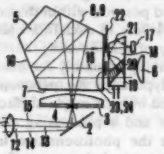
1. A light measuring apparatus for a single lens reflex camera having an eye-piece and comprising :

an objective lens,

a focusing screen on which an imagee is formed by the objective lens,

a pentagonal roof prism for directing light from the screen toward the eye-piece, said prism having a incident face, two roof faces, a front reflective plane and an exit face, said exit face having an upper part as well as left and right end portions,

only one light receiving means facing the upper part of the exit face of the prism for receiving a first set of light rays from the upper part of the exit face,



a reflecting means for directing a second set of light rays from both left and right end portions of the exit face of the prism toward the light receiving means, and

a shutter means in the optical path of at least one of the sets of light rays .

3,996,595

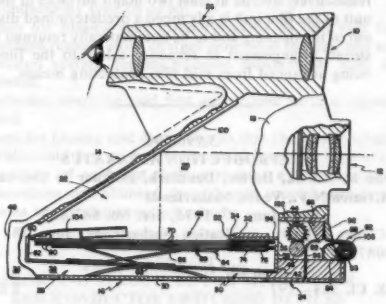
PHOTOGRAPHIC APPARATUS WITH EXTENDABLE LIGHT TIGHT IMBIBING MEANS

Andrew S. Ivester, Charlestown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 466,371, May 2, 1974. This application Apr. 21, 1975, Ser. No. 569,761

Int. Cl.² G03B 17/00

U.S. Cl. 354—83 30 Claims



1. Photographic apparatus for processing an exposed film unit of the type having opposed major surfaces and including a pod of processing fluid arranged to release the processing fluid retained therein along a photosensitive layer of the film unit in response to a compressive force being exerted thereagainst, said apparatus comprising:

a housing formed of opaque material, said housing being configured to retain at least one of the exposed film units at a given position and to define an opening through which the film unit may be advanced from said housing;

a pair of elongated juxtaposed members located intermediate said given position within said housing and said opening and arranged to first exert a compressive force on the pod to release the processing fluid retained therein and then to subsequently direct the released processing fluid progressively to the exposed film unit being advanced from its said given position within said housing through said opening; and

means for protecting substantially the two major surfaces of the film unit from ambient light rays as the film unit

emerges from said housing through said opening, said means including at least one opaque member mounted from said housing in a normally stored position entirely within the confines of said housing; said means being structured and arranged to be automatically progressively extended from the confines of said housing to respectively overlie at least two major surfaces of the film unit as the film unit is advanced a predetermined distance outward of said opening, and to be automatically returned to said stored position within the confines of said housing, in response solely to said film unit being advanced further outwardly of said opening.

30. An imbibing assembly for use with photographic apparatus of the type used for processing an exposed film unit having opposed outside major surfaces together with a photosensitive layer and a processing composition adapted to be spread across the photosensitive layer wherein the photographic apparatus includes means for applying pressure to the exposed film unit and a housing configured to retain at least one of the exposed film units at a given position and to define an exit opening located forwardly of the pressure applying means through which the film unit may be advanced from the housing, said imbibing assembly comprising:

a frame member releasably mounted to the photographic apparatus housing adjacent the path of travel of the exposed film unit as the exposed film unit moves through the exit opening in the housing; and

means for at least protecting two opposed major photosensitive surfaces of the film unit from ambient light rays as the film unit emerges from the housing through the opening, said means including at least one opaque member mounted to said frame member in a predetermined stored arrangement, said arrangement being insensitive to changes in the orientation of said apparatus, said film protection means being structured and arranged to be automatically progressively extended from the housing to respectively overlie at least two major surfaces of the film unit as the film unit is advanced a predetermined distance out of the opening and to be automatically returned to the stored arrangement in response solely to the film unit being advanced from said film protecting means.

3,996,596

REPRODUCTION APPARATUS

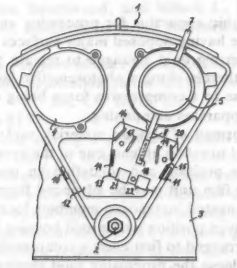
Ryan R. Kurtik, Herlev, Denmark, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed June 17, 1975, Ser. No. 587,537

Claims priority, application Netherlands, June 28, 1974, 7408751

Int. Cl.² G03B 3/00, 13/02

U.S. Cl. 354—197 2 Claims



1. Reproduction apparatus provided with at least two objectives mounted on or in a holder, which objectives are provided with an organ for the adjustment of the diaphragm aperture, and of which the holder can be displaced laterally and along the optical axis of the reproduction apparatus, respectively to select one of the objectives for the imagewise exposure of a light-sensitive material, and to bring the position of the selected objective in correspondence with the required reproduction factor, characterized in that the holder and the organs for the adjustment of the diaphragm are provided with one or more signal initiators and an element is installed near the holder, which can only be displaced along the optical axis together with the holder, and is provided with two series of detectors, whereby dependent on the objective selected, one of the detectors of the one series is caused to react to a signal initiator on the holder, and dependent on the diaphragm aperture selected one of the detectors of the other series is caused to react to a signal initiator of the corresponding organ for the adjustment of the diaphragm aperture.

3,996,597

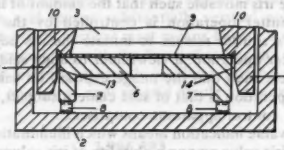
PHOTOGRAPHIC CARTRIDGE CAMERA

Werner Hahn; Walter Hennig, both of Dresden, and Bernhard Walther, Dessau, all of Germany, assignors to VEB Pentacon Dresden, Germany

Filed Dec. 24, 1974, Ser. No. 536,235

Int. Cl.² G03B 17/02

U.S. Cl. 354—288 2 Claims



1. A photographic camera adapted to receive film cartridges having a film supply chamber, a take-up chamber and a web connecting said chambers having a surface over which the film is conveyed, said camera comprising:

a. a housing formed to receive said cartridge;

b. an internal support member within said housing having a film engagement surface thereon;

c. guide channel means having two walls each extending from one side of said support member substantially beyond the plane of the film engagement surface and spaced substantially the width of the web and film; and

d. inner surfaces on said walls forming said guide channel capable of receiving and guiding said cartridge; and the side edges of the film;

wherein when said cartridge is fitted in said camera, the cartridge web and the film thereon are located between said guide channel surfaces, and said film engagement surface presses against the film to bring this into contact with the film conveying surface of said cartridge.

3,996,598

ATTACHABLE POCKET CAMERA LENS AND BRACKET

Anthony Sansone, Stamford, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 10, 1975, Ser. No. 630,465

Int. Cl.² G03B 17/56

U.S. Cl. 354—295 3 Claims

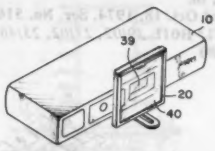
1. An assembly adaptable for fastening to a camera for mounting an auxiliary lens or filter in front of the lens of the camera comprising

a bracket in the form of an L-shaped plate having two legs, with a slot formed in each of the said two legs of the plate,

an open rectangular shaped frame formed of two U-shaped side sections joined to a U-shaped bottom section, with the recesses of the side and bottom sections facing the center of the frame,

said bottom section of the frame formed with a slot in an intermediate segment of the U-shaped bottom section, together with

fastening means for joining the frame to a first leg of the bracket through the respective slots in the frame and said first leg,



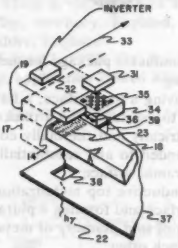
said first leg of the bracket of a size to extend beyond the front of an attached camera, when the second leg of the bracket is bolted to the female thread of the tripod mount fitting of the camera.

3,996,599

IMAGE DETECTOR WITH BACKGROUND SUPPRESSION

Gerard J. King, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,855
Int. Cl.² H01L 27/14, 31/00, 29/78, 29/12
U.S. Cl. 357—30 **3 Claims**



1. A detector for sensing and storing the amplitude of one or more flux samples from a beam of incident photons comprising:

a base layer of an intrinsic semiconductor;

a pair of separate channels of doped semiconductor formed into said base layer, having exposed surfaces coplanar with one surface thereof, said channels having majority and minority charge carriers of opposite conductivity types;

a thin layer of insulating material attached to and covering said coplanar surfaces;

at least a first pair of separate but closely adjacent planar gate electrodes mounted on said insulating layer so that each electrode covers an underlying surface portion of a different one of said channels:

voltage generating means electrically coupled to each said pair of electrodes for applying alternating bias voltage pulses of opposite polarity thereto relative to the voltage of said base;

an opaque structure surrounding said detector including a thin conducting screen substantially spaced from and parallel to said base layer and electrodes, except at the edges thereof, said screen having windows therein adjacent to said underlying said surface portions of only one of said pair of channels, whereby charge carriers of one polarity are periodically generated and stored under electrodes in said one channel in direct proportion to flux samples admitted by said windows and carriers of the opposite polarity are simultaneously stored under electrodes in the remaining channel in direct proportion to the radiation temperature of the screen;

said channels being so closely spaced that carriers stored simultaneously under said closely adjacent electrodes are drawn by mutual attraction into said base layer and recombine, leaving substantially only a net charge on one electrode; and

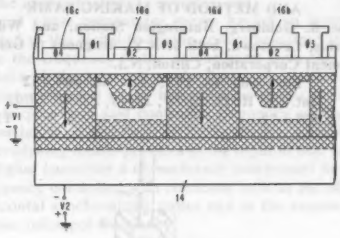
readout means electrically coupled to said electrodes to periodically store the amplitude of said net charge.

3,996,600

CHARGE COUPLED OPTICAL SCANNER WITH BLOOMING CONTROL

Nicholas Alex Patrin, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 10, 1975, Ser. No. 594,892
Int. Cl.² H01L 27/14, 31/00, 29/78
U.S. Cl. 357—30 **3 Claims**



1. A charge coupled optical scanner comprising:

a semiconductor body of a first conductivity type (*p* or *n*);

said body having therein alternating first and second surface regions, both of said surface regions being of the opposite conductivity type (*n* or *p*);

means for biasing said surface regions so that said first surface regions store charges generated therein, and said second surface regions become substantially fully depleted;

electrodes overlying said first and second surface regions; and

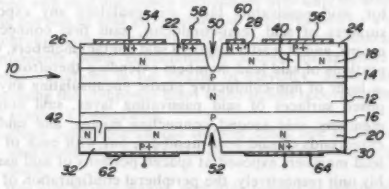
means for biasing said electrodes so that charges generated within said first surface regions which exceed the storage capacity of said first surface regions will be extracted therefrom and shunted through said second surface regions to said semiconductor body.

3,996,601

SHORTING STRUCTURE FOR MULTILAYER SEMICONDUCTOR SWITCHING DEVICES

Jerald L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Continuation-in-part of Ser. No. 488,789, July 15, 1974. This application Apr. 16, 1975, Ser. No. 568,470
Int. Cl.² H01L 29/747
U.S. Cl. 357—39 **13 Claims**



1. In a symmetrical semiconductor switch, the combination comprising:

a body formed from a plurality of alternating layers of first

and second types of semiconductor materials, said body having interior layers and first and second outer layers each having adjacent regions of said first and second types of semiconductor material,

first and second electrodes contacting different regions of said first outer layer and a third electrode contacting regions of said second outer layer to form a three terminal symmetrical switch,

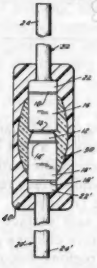
means for electrically connecting at least one of said regions in each said first and second outer layers with ones of said interior layers which are not immediately adjacent said outer layers, wherein the switching speed and static dv/dt and commutating capability of said switch is improved.

3,996,602

PASSIVATED AND ENCAPSULATED SEMICONDUCTORS AND METHOD OF MAKING SAME

Monroe B. Goldberg, Huntington Station, and William B. Voorhis, Levittown, both of N.Y., assignors to General Instrument Corporation, Clifton, N.J.

Filed Aug. 14, 1975, Ser. No. 604,722
Int. Cl.² H01L *23/28, 23/48, 23/30, 23/02*
U.S. Cl. 357—72 **11 Claims**



1. An encapsulated and passivated semiconductor comprising

A. a single glass passivated semiconductor assembly unit comprising

a. a semiconductor assembly including

i. a unitary semiconductor,

ii. a plurality of conductive lead members,

iii. a plurality of conductive metal contact members,

iv. a plurality of first connecting means, each of said first connecting means securing said semiconductor to an end of a respective one of said contact members, and

v. a plurality of second connecting means, each of said second connecting means securing the other end of said respective contact member to an end of a respective one of said lead members; and

b. a homogeneous passivating layer of non-conductive glass having a thermal coefficient of expansion compatible with those of said contact members and said semiconductor, said passivating layer encapsulating any exposed surfaces of said semi-conductor, said first connecting means, and at least a length of said contact members, with portions of said lead members extending therefrom; and

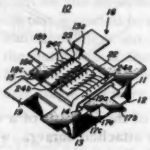
B. a layer of non-conductive plastic encapsulating any exposed surfaces of said passivating layer, said contact members, said second connecting means, and said secured ends of said lead members, but with each of said lead members exposed at spaced portions of said assembly unit respectively, the peripheral configuration of said encapsulating layer being such as to cooperate with automatic handling equipment and encapsulating only said single glass passivated semiconductor assembly unit; whereby said unit can be effectively handledby said equipment.

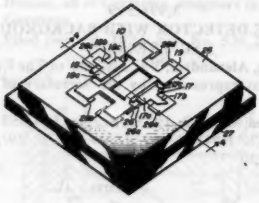
3,996,603

RF POWER SEMICONDUCTOR PACKAGE AND METHOD OF MANUFACTURE

John Marvin Smith, Glen Ellyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 18, 1974, Ser. No. 516,054
Int. Cl.² H01L *39/02, 27/02, 23/48, 23/02*
U.S. Cl. 357—80 **8 Claims**





1. A power semiconductor package for use in hybrid power assemblies comprising:

a ceramic base having a top surface, a flat bottom surface parallel to said top surface, and a thickness;

a solderable electrically and thermally conductive bottom metalization bonded to and substantially covering all of said bottom ceramic surface;

an electrically conductive top metalization bonded to said top ceramic surface and forming a plurality of top metalized areas each of said plurality of metalized areas being isolated from each other;

a plurality of flat metal leads bonded to said plurality of top metalized areas, each of said leads including a portion contacting at least one of said top metalized areas, a projection of a first width extending from said contacting portion outward and substantially beyond the edge of said ceramic base, and a further outward extension having a second narrower width; and

a semiconductor chip mechanically mounted to said ceramic top surface and electrically coupled to said plurality of top metalized areas.

3,996,604

VAPOR COOLED SEMICONDUCTOR DEVICE HAVING AN IMPROVED STRUCTURE AND MOUNTING ASSEMBLY

Yoshio Kimura, and Hiroshi Mitsuoka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1975, Ser. No. 545,346
Claims priority, application Japan, Jan. 30, 1974, 49-12985
Int. Cl.² H01L *25/04, 23/42, 23/44, 23/46*
U.S. Cl. 357—82 **9 Claims**

1. A vapor cooled semiconductor device, comprising:

an envelope having at least one aperture;

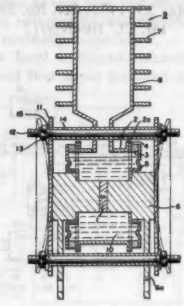
at least one semiconductor element enclosed in said envelope;

an electrode contacting said semiconductor element and disposed within said aperture of said envelope so as to define a gap between said electrode and said envelope;

expandable sealing means insulatively disposed between

and in contact with said electrode and the wall of said envelope so as to seal the gap therebetween;

resilient pressing means disposed about said envelope and in contact with said electrode so as to support said semiconductor element through said electrode under pressure; and



a liquid coolant enclosed in said closed envelope, but not filling the same, to cool said semiconductor element by the latent heat of vaporization thereof.

3,996,605

TIME BASE CORRECTOR

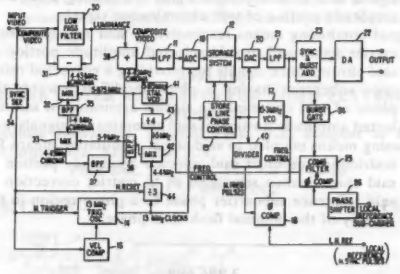
John Albert Coffey, Newbury, England, assignor to Quantel Limited, Berkshire, England

Filed June 2, 1975, Ser. No. 582,967

Claims priority, application United Kingdom, June 6, 1974, 25073/74

Int. Cl.² H04N 9/02, 5/76

U.S. Cl. 358—8 5 Claims



1. A time base corrector for retiming the chrominance and luminance components of a non-phased television picture signal from a PAL video tape recorder including off-tape horizontal sync pulses and color bursts to local horizontal sync pulse frequency and local sub carrier reference frequency, said corrector comprising:

a. digital storage means having an input and an output;

b. an analog-to-digital converter having an input and having an output connected to the input of the storage means;

c. "Write" clock pulse generating means connected with the analog-to-digital converter and the storage means to clock signals from said converter into said storage means;

d. a digital-to-analog converter connected to the output of the storage means to deliver an analog signal;

e. "Read" clock pulse generating means having an output clock pulse frequency, the "Read" clock pulses being connected with the digital-to-analog converter and with the storage means to read stored signals into the converter from said storage means;

f. a divider connected to the output of said "Read" clock generating means and operative to deliver divided frequency pulses at the local horizontal sync pulse frequency;

g. first phase comparator means connected to said divider to compare the local horizontal sync pulse frequency with the divided pulse frequency from said divider and connected to the "Read" clock pulse generating means for controlling the output frequency thereof;

h. horizontal synchronizing pulse addition means connected with an output of the digital-to-analog converter for receiving the analog signal from the digital-to-analog converter and for adding thereto a horizontal synchronizing pulse in exact time relationship with the local horizontal sync frequency;

i. heterodyning means having a controlled frequency oscillator and having an input connected to receive said non-phased television signal and having an output connected to the analog-to-digital converter; and

j. second phase comparator means having an input connected to the digital-to-analog converter output to compare the frequency of the colour burst from the stored signal with the local sub carrier frequency and having an output connected to the heterodyning means to control the frequency of said controlled frequency oscillator in dependance on said compared frequencies, whereby the heterodyning means provides at the input to said analog-to-digital converter a chrominance component having a frequency controlled with reference both to the off-tape horizontal synchronizing pulses and to the required sub carrier reference frequency.

3,996,606

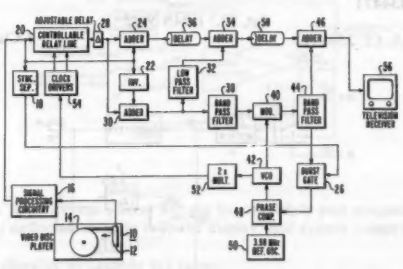
COMB FILTER FOR VIDEO PROCESSING

Dalton Harold Pritchard, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1975, Ser. No. 559,401

Int. Cl.² H04N 5/76

U.S. Cl. 358—8 12 Claims



9. In a system for playback of recorded composite color video signals, including a luminance component occupying a given frequency band, and a chrominance component interleaved with said luminance component over only an intermediate portion of said given band and accompanied by a color synchronization component, said composite color video signal components being concomitantly subject to spurious frequency variations in the course of playback; apparatus for processing the composite color video signals recovered during said playback comprising:

a clock controlled charge transfer delay line receptive to said composite color video signals recovered during playback;

a first comb filter means, including means for subtractively combining delayed signals provided at the output of said delay line with undelayed composite color video signals, for subjecting said composite color video signals to a first frequency response characteristic having multiple rejec-

tion notches lying at a first plurality of spaced frequencies;

a modulator coupled to an output of said combining means for frequency translating signals provided thereat;

separating means coupled to an output of said modulator for separating a frequency translated version of said color synchronization component from said frequency translated signals;

a source of reference signals having a frequency substantially equal to that of said frequency translated version of the color synchronization component in the absence of said spurious frequency variations;

phase comparator means coupled to said source of reference signals and said separating means for developing an output indicative of the phase relationship between said reference signals and said frequency translated version of said color synchronization component;

means responsive to said output of said comparator means for stablizing the component frequencies of said frequency translated signals; and

means, responsive to spurious variations of the frequency of the color synchronization component of said recovered composite color video signals, for supplying clock signals to said delay line, with the frequency of said clock signals varying in consonance with the spurious frequency variations of said composite color video signal components so as to effect a variation of said first plurality of spaced frequencies with a sense and timing consonant with said spurious frequency variations of said composite color video signal components.

3,996,607

SYSTEM FOR DIGITAL TRANSMISSION OF COLOR TELEVISION SIGNALS

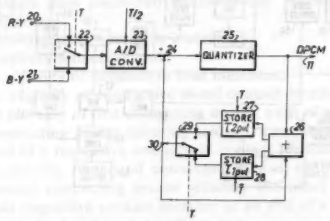
Jürgen Heitmann, Seeheim, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 17, 1975, Ser. No. 596,842

Claims priority, application Germany, July 18, 1974, 2434471

Int. Cl.² H04N 9/32

U.S. Cl. 358—13 **8 Claims**



1. In a system for digital transmission of a color television signal comprising several chrominance and luminance signal components comprising:

A. a coder for coding the color television signal by difference pulse code modulation,

B. means for transmitting the coded signal, and

C. a decoder for receiving and decoding the transmitted signal

the improvement comprising

D. means for time multiplexing a plurality of said signal components in a single said coder, including means responsive to a clock signal for triggering the coder to operate in a time multiplex mode, and

E. means for time demultiplexing said plurality of said signal components in a single said decoder, including means responsive to the clock signal for triggering the decoder to operate in a time multiplex mode.

3,996,608

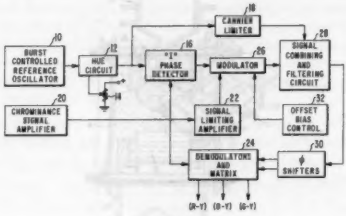
HUE CORRECTION APPARATUS HAVING A RESTRICTED RANGE

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,681

Int. Cl.² H04N 9/12

U.S. Cl. 358—28 **7 Claims**



1. In a system for processing color television signals including chrominance signals having a phase representative of hue and an amplitude representative of saturation of colors present in a scene, said television signals further including a reference subcarrier signal having a nominal phase relative to said chrominance signals, hue correction apparatus comprising:

means having at least a first input responsive to said reference subcarrier signal and at least a second input responsive to said chrominance signals for providing a control signal with a wide bandwidth relative to said chrominance signals and representative of a phase relationship between said chrominance signals and chrominance signals represenative of flesh tones as determined by the nominal phase of said reference subcarrier;

signal modulating means responsive to said chrominance signals and to said control signal for passing a selected amplitude portion of said chrominance signals;

signal combining means responsive to said reference subcarrier signal and to said selected amplitude portion of said chrominance signals for providing a corrected reference subcarrier having a phase modified towards the phase of said chrominance signals according to said selected amplitude portion of said chrominance signals; and

biasing means coupled to said signal modulating means for restricting output of said selected amplitude portion of said chrominance signals so as to restrict correction of said reference subcarrier phase to a phase region in the vicinity of the nominal flesh tone phase.

3,996,609

AMPLIFIER SUITABLE FOR USE AS A COLOR KINESCOPE DRIVER

Leslie Ronald Avery, Lightwater, England, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,898

Claims priority, application United Kingdom, May 5, 1975, 17249/75

Int. Cl.² H04N 9/50, 9/535, 9/537

U.S. Cl. 358—30 **11 Claims**

1. In a television receiver including an image reproducing device, a source of chrominance signals, a source of luminance signals and a source of horizontal blanking pulses, said horizontal blanking pulses occurring during the time interval during which said image reproducing device is horizontally retraced, the apparatus comprising:

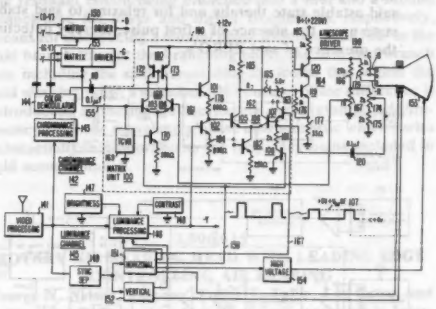
amplifying means for combining said chrominance signals and said luminance signals, said amplifying means including first and second input terminals and an output terminal, said output terminal being direct current coupled to said image reproducing device, said second input termi-

nal being direct current coupled to said source of said luminance signals;

first capacitive means for coupling said chrominance signals to said first input terminal;

comparator means having first and second input terminals for comparing voltages applied thereto, said comparator means being normally inoperative;

a relatively low level stabilized reference voltage source coupled to said first input terminal of said comparator means;



means coupled to said second input terminal of said comparator means for providing a direct voltage proportional to the direct voltage developed at said output terminal;

means for selectively rendering said comparator operative in response to said horizontal blanking pulses; and

current converting means coupled to said comparator and to said first capacitive means for charging and discharging said capacitive means to a direct voltage level in relation to the difference in voltage between said first and second input terminals of said comparator means so as to counteract the changes of the voltage developed at said output terminal.

3,996,610

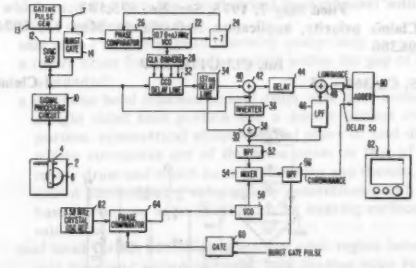
COMB FILTER APPARATUS FOR VIDEO PLAYBACK SYSTEMS

Hirohisa Kawamoto, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,818

Int. Cl.² H04N 9/02

U.S. Cl. 358—31 **5 Claims**



1. A comb filter apparatus for filtering a composite color video signal, wherein said composite color video signal includes chrominance and luminance signal components, and wherein said chrominance component includes a reference signal component, said composite color video signal components being undesirably subject to spurious frequency variations; said apparatus comprising:

a. means for receiving said composite color video signal;

b. a clock controlled variable delay line, having clock input terminals and having a video signal input terminal coupled to said receiving means, for imparting to said composite color video signal a delay of a magnitude determined by the frequency of clock signals applied to said clock input terminals;

c. a voltage controlled oscillator for developing said clock signals;

d. a frequency dividing network coupled to said oscillator;

e. a phase comparator, responsive to an output of said frequency dividing network and to the reference signal component of the composite color video signal received by said receiving means, for developing an error signal representative of departures from a predetermined phase relationship between said reference signal component and said output of said frequency dividing network;

f. means for applying said error signal to said oscillator to control the frequency of operation thereof in a sense to oppose said departures from said predetermined phase relationship between said reference signal component and said output of said frequency dividing network;

g. means, including a first signal combiner responsive to respective outputs of said receiving means and said delay line, for developing signals representative of said chrominance component to the substantial exclusion of said luminance component; and

h. means, including a second signal combiner responsive to respective outputs of said receiving means and said delay line, for developing signals representative of said luminance component to the substantial exclusion of said chrominance component.

3,996,611

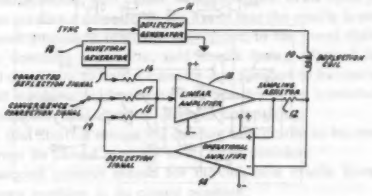
CATHODE RAY TUBE DEFLECTION CIRCUIT

Rodney K. Toone, Sunnyvale, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Sept. 25, 1974, Ser. No. 509,085

Int. Cl.² H04N 9/09, 9/31

U.S. Cl. 358—51 **5 Claims**



1. A deflection system for use in a multiple unit magnetically deflected cathode ray tube display, said system comprising:

a plurality of cathode ray tubes;

a plurality of deflection coils, each deflection coil associated with a respective one of said cathode ray tubes;

a deflection current generator having a plurality of outputs, each output connected to one end of a related one of said plurality of coils, said generator being capable of supplying all of the current required to completely deflect the beams in said cathode ray tubes;

a plurality of linear amplifiers, each linear amplifier being capable of deflecting said beam of its associated cathode ray tube to an appreciable fraction of its normal requirement;

a plurality of sampling resistors, each connected between a second end of a related one of said deflection coils and the output of a related one of said linear amplifiers whereby each output of said deflection current generator, a related one of said deflection coils, a related one of said sampling resistors, and a related one of said linear amplifiers are connected in series combination, each of said sampling resistors having a resistance small compared to the resistance of the series combination with which it is associated;

a plurality of reference signal generating means, each generating a signal waveform representative of the desired current in a related one of said deflection coils;

a plurality of correctional amplifier means, each having its input coupled to a respective one of said sampling resistors;

a plurality of signal combining means, each combining the output of a related one of said reference signal generating means and the output of a related one of said correctional amplifier means and supplying the combined signal to the input of a related one of said linear amplifier means;

a source of a plurality of convergence correction signals; and

means for supplying one of said convergence correction signals to the related input of at least all but one of said linear amplifiers, thereby to conform the displays of said plurality of cathode ray tubes.

3,996,612

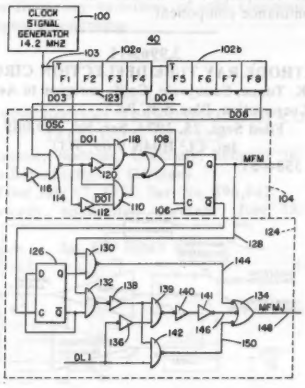
TEST CODE GENERATOR

Charles J. Fassbender, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed July 7, 1975, Ser. No. 594,145

Int. Cl.² G11B *5/02*

U.S. Cl. 360—40 **12 Claims**



1. A test code generator, comprising:

timing means for generating clock signals having a basic period;

means coupled to said timing means for counting the clock signals, said counting means generating a plurality of output signals each having a period which is a 2^n multiple of the basic period

means coupled to both said timing means and said counting means and responsive to selected ones of the plurality of output signals for generating a series of self-clocking binary digits having a period at least twice the basic period, the series of binary digits being representative of a predetermined test code.

3,996,613

DATA RECORDING AND TRANSMISSION APPARATUS UTILIZING NON-CONSECUTIVE ZERO CODING

Kenzel P. Manning, Phoenix, Ariz.; Martin Cohn, Arlington, Mass., and Abraham Lempel, Croton-on-Hudson, N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,347

Int. Cl.² G11B *5/09*

U.S. Cl. 360—40 **11 Claims**

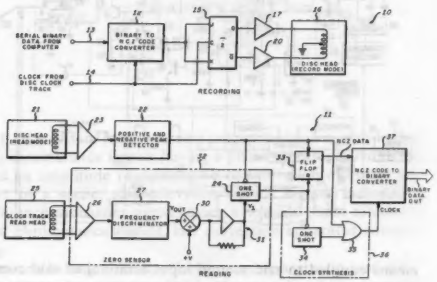
1. Magnetic medium recording and reproducing apparatus for binary data signals comprising

first converter means for converting said binary data signals to non-consecutive zero recording code signals,

means for recording said non-consecutive zero code signals on said medium by generating a flux transition for each ONE of said non-consecutive zero signals and by not generating a flux transition for each ZERO thereof,

detecting means for detecting said flux transitions and providing first pulses in accordance therewith, respectively, thereby detecting the presence of said ONE's,

monostable means having a stable state and an astable state and responsive to said first pulses for being maintained in said astable state thereby and for relaxing to said stable state upon the absence of a first pulse, thereby detecting the presence of said ZERO's,



pulse generating means coupled to said monostable means for providing second pulses in response to said relaxing of said monostable means,

combining means responsive to said first and second pulses for providing a clock pulse train in accordance therewith,

data generating means responsive to said first pulses and coupled to said monostable means for providing non-consecutive zero recorded data signals, and

second converter means responsive to said non-consecutive zero recorded data signals and said clock pulse train for converting said non-consecutive zero recorded data signals to binary data signals in synchronism with said clock pulse train.

3,996,614

DEVICE FOR READING A MAGNETIZED RECORD CARRIER

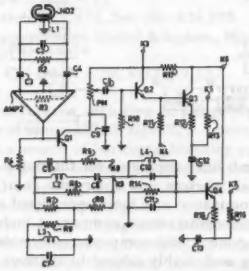
Jaromir Budějicky, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,182

Claims priority, application Netherlands, May 13, 1974, 7406380

Int. Cl.² G11B *5/09*

U.S. Cl. 360—45 **4 Claims**



1. A device for reading a self-clocking digital information which is stored as a bivalent state of a moving carrier material,

the information being formed by frequencies which are situated in a predetermined frequency range, the said device comprising a differentiating read member provided with a read winding along which the carrier material can be driven, and furthermore comprising an adding device, a series connection of a resonant circuit and a transmitting device having a drooping amplitude/frequency response curve, an intermediate output and a final output of the series connection being connected to inputs of said adding device, an information signal being reformed on an output thereof, output leads of the resonant circuit being branched into a first and a second branch line for lower and higher frequencies, respectively, means for introducing a mutual phase difference of 180° in the said branch lines at the branching point, the said first branch line including the said transmitting device so that within the said working range a substantially constant phase difference is introduced, a filtering device having a rising amplitude/frequency response curve and a phase characteristic which varies substantially in proportion to the frequency being included in said second branch.

3,996,615

ROTARY AIR BEARING HEAD WITH LEADING EDGE CONTROLLING AIR BEARING

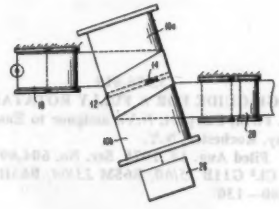
George N. Nelson, Milpitas; Frank E. Talke, Los Gatos, and Raymond C. Tseng, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,964

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² G11B *5/60, 21/20, 15/64*

U.S. Cl. 360—102 **12 Claims**



1. A rotary magnetic head assembly for use in a rotary head magnetic tape recorder of the self acting air bearing type, which recorder includes a cylindrical tape mandrel with two sections defining a gap,

said rotary magnetic head assembly comprising:

a rotary drum for coaxial disposition within the gap of such a mandrel;

a magnetic head attached to said drum, said head including a right sided base portion and a doubly convex crown portion, symmetrical about an axial plane of said drum, whose curvatures are of the same order as that of said rotary drum and which has a transducing gap therein, said crown portion being substantially coterminous with said base portion so as to provide an air bearing surface for said head;

said head further including a leading edge region between said base and crown portions, said leading edge region being configured to be relatively flatter and of substantially smaller area than said crown portion and with an angle of attack intermediate those of the adjacent crown and base portions, said leading edge region and crown portion projecting entirely beyond the periphery of said mandrel, whereby upon rotation of said drum an air bearing is provided for a tape of a uniform thickness between 5 and 100 microinches over substantially the whole length of said crown portion.

3,996,616

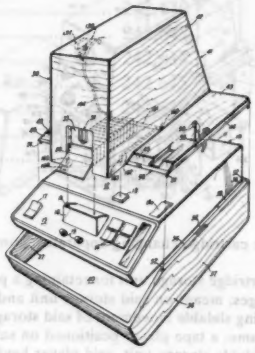
COMBINATION CASSETTE CHANGER AND RECORDING MACHINE

James C. Sturrock, Atlanta, and Robert N. Fink, Decatur, both of Ga., assignors to Robert N. Fink, Decatur, Ga.

Filed Jan. 20, 1975, Ser. No. 542,108

Int. Cl.² G11B *23/04, 5/00*

U.S. Cl. 360—92 **6 Claims**



1. A cassette changer for a magnetic tape mechine of the type having a cradle moveable between an open position and a closed position, said cradle being adapted, in its open position, to receive a cassette, in the event that the cradle is empty and have a cassette removed therefrom, in the event that the cradle contains a cassette, said cradle being adapted in its closed condition to hold a cassette in a position to be operated by said machine; said cassette in a position to be operated by said machine; said cassette changer comprising:

a. a first control means for causing said cradle to be moved from its closed position to its open position;

b. second control means for moving said cradle from its open position to its closed position;

c. a magazine for supporting a plurality of replacement cassettes;

d. cassette engaging and moving means for engaging and removing a cassette from said cradle when said cradle is in its open position and contains such a cassette, and for thereafter inserting a replacement cassette from said magazine into said cradle while said cradle remains in its open position; and

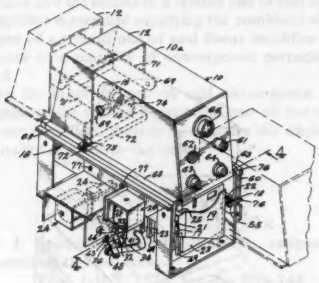
e. means for actuating in sequence said first control means and then said cassette engaging and moving means and thereafter said second control means, said cassette engaging and moving means including a plate movable toward and away from said machine, a ram movably carried by said plate, spring means for yieldably urging said ram toward said machine, said ram being positionable in registry with the open cradle of said machine for engaging the rear edge of a cassette within the opened candle when said plate is moved toward said cradle, ejector means connected to said plate for movement with said plate beyond the travel of said ram after said ram has engaged the rear portion of said cassette for engaging another portion of the cassette within said open cradle for grasping the same between said ejector means and said ram as said plate is moved away from said cradle.

3,996,617

TAPE CARTRIDGE CHANGER APPARATUS

Bernard A. Cousino, Fort Myers, Fla., assignor to Cousino Corporation, Fort Myers, Fla.

Filed Apr. 16, 1975, Ser. No. 568,787
Int. Cl.² G11B 15/68
U.S. Cl. 360—92 11 Claims



1. A tape cartridge changing apparatus, comprising:

a frame;

a tape cartridge storage unit for retaining a plurality of tape cartridges; means on said storage unit and on said frame providing slidable movement of said storage unit through said frame; a tape player positioned on said frame above said slidable storage unit, said player having a cartridge-receiving slot disposed directly above said storage unit at a first location and adapted to receive, in tape-playing engagement, a tape cartridge lifted upwardly from said storage unit;

means for lifting a tape cartridge positioned below such cartridge-receiving slot upwardly into the slot, said lifting means comprising a solenoid having a generally vertically reciprocable plunger, a lifting arm privoted on a generally horizontal axis and including a lifting end opposite the pivot axis adapted to contact a bottom surface of a tape cartridge in the storage unit, and connecting means extending from said plunger for raising said lifting arm in an arcuate path about said axis to lift a tape cartridge from said storage unit into the cartridge-receiving slot of said tape player; means for releasing a tape cartridge from the slot of the player, to drop the cartridge back into the storage unit; and

means for slidably advancing the storage unit to position another tape cartridge in the storage unit adjacent such cartridge-receiving slot of the tape player.

3,996,618

RETENTION DEVICE FOR CASSETTE TAPE RECORDER

Shoji Suzuki, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

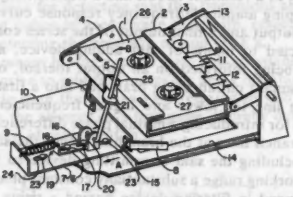
Filed Jan. 2, 1975, Ser. No. 538,099
Claims priority, application Japan, Feb. 25, 1974, 49-22638
Int. Cl.² G11B 15/24, 23/04, 15/66
U.S. Cl. 360—96 7 Claims

1. A retention device for a cassette tape recorder having a chassis including in combination:

a cassette holder mounted on the chassis of said recorder and located a predetermined distance above said chassis;

a slidable platform on said chassis and on which at least a transducer head is mounted for movement therewith;

a movable plate slidably mounted on said chassis and adapted to be moved by the movement of said slidable platform; and



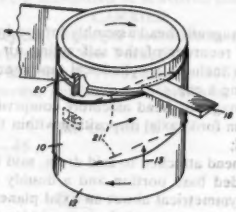
a retention lever means having a first end rotatably mounted on said movable plate, a mid-point captivated by said cassette holder and a free end located adjacent a cassette in said cassette holder for pressing such cassette firmly toward said magnetic transducer head in response to the moving of said slidable platform and said movable plate into a predetermined position.

3,996,619

TAPE EDGE GUIDE FOR A FULLY ROTATABLE DRUM

Ronald R. Firth, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,697
Int. Cl.² G11B 15/60; B65M 23/04; B65H 23/32
U.S. Cl. 360—130 11 Claims



1. Apparatus for guiding a recording tape in a recording machine, said apparatus comprising:

an edge guide member;

a generally cylindrical drum and means mounting said drum for rotation about its longitudinal axis, said drum having a groove in said drum surface, said groove extending circumferentially around said drum surface, and said groove being large enough to permit said guide member to protrude therein;

means supporting said guide member in a fixed position such that said guide member protrudes into said groove and abuts an edge of the tape, whereby during operation the tape advances over said rotating drum and is restrained from lateral wander by said guide member.

DESIGN PATENTS

GRANTED DECEMBER 7, 1976

ERRATA

For CLASS	See PATENT NO.
011–157	242,640
011–090	242,643
011–044	242,644
011–027	242,645
011–002	242,646
015–123	242,649
015–005	242,650
015–007	242,651

DESIGN PATENTS

GRANTED DECEMBER 7, 1976

ERRATA

PATENT NO. CLASS

D241,040 220-110

D241,126 220-110

D241,127 220-110

D241,142 220-110

D241,143 220-110

D241,144 220-110

D241,145 220-110

D241,146 220-110

D241,147 220-110

D241,148 220-110

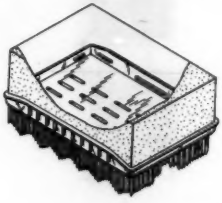
DESIGNS

DECEMBER 7, 1976

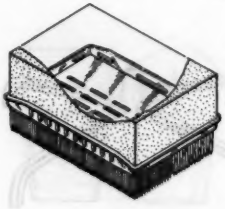
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

242,583
SPORTS SHOE
Lewis Charles Knight, Raunds, England, assignor to St. Crispin Footwear Limited, Raunds, England
Filed May 20, 1975, Ser. No. 579,154
Claims priority, application United Kingdom, Nov. 21, 1974, 968795/74
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—311

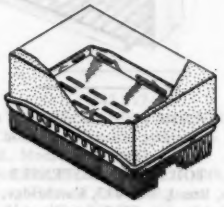
242,584
COMBINED BRUSH AND SPONGE
Jack W. Kaufman, Merrick, N.Y., assignor to Bio Med Plastics, Inc., Merrick, N.Y.
Filed July 9, 1975, Ser. No. 594,306
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—17



242,585
COMBINED BRUSH AND SPONGE
Jack W. Kaufman, Merrick, N.Y., assignor to Bio-Med Plastics, Inc., Merrick, N.Y.
Filed July 9, 1975, Ser. No. 594,307
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—17

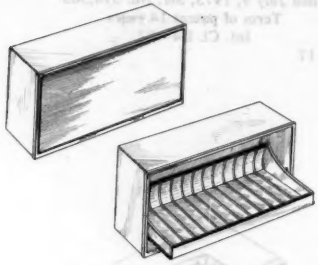


242,586
COMBINED BRUSH AND SPONGE
Jack W. Kaufman, Merrick, N.Y., assignor to Bio Med Plastics, Inc., Merrick, N.Y.
Filed July 9, 1975, Ser. No. 594,308
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—17

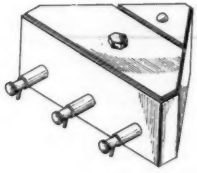


242,587
DESK
William Sklaroff, 726 E. Conshohocken State Road, Penn Valley, Pa. 19072
Filed Aug. 5, 1975, Ser. No. 602,131
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—25

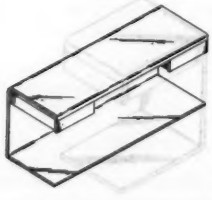
242,588
PIVOTING SOAP TRAY
Edouard Hewak, Voves, France, assignor to Societe Balneo S.A.R.L., Arcueil, France
Filed Apr. 3, 1973, Ser. No. 347,524
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—90



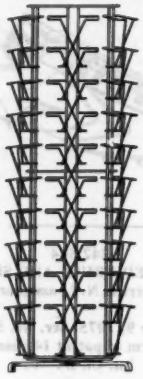
242,589
TOILETRIES DISPENSER
Joseph A. Leto, Rte. 1, Box 413, Cambridge, Wis. 53523
Filed Nov. 3, 1975, Ser. No. 628,108
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



242,590
DESK
William Sklaroff, 726 E. Conshohocken State Road, Penn Valley, Pa. 19072
Filed Aug. 5, 1975, Ser. No. 602,130
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



242,591
RACK FOR POCKETBOOKS, MAGAZINES AND THE LIKE
Donald Leroy Hurd, 1428 Beach No. 1, Montebello, Calif. 90640
Filed July 9, 1975, Ser. No. 594,527
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188

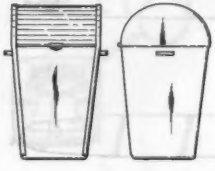


242,592
BASE FOR SWIVEL CHAIR
Gregory S. Gabourie, Ajax Lis, Canada, assignor to Global Upholstery Company Limited
Filed June 5, 1975, Ser. No. 584,181
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

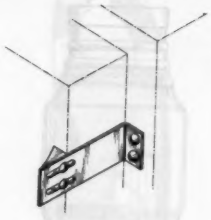
242,593
BARBEQUE
James R. Sterkel, Box 495, Rancho Santa Fe, Calif. 92067
Filed Aug. 21, 1975, Ser. No. 606,719
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

242,594
KITCHEN RANGE
Wallace A. Monson, Big Lake, Minn., assignor to Litton Systems, Inc., Minneapolis, Minn.
Filed June 30, 1975, Ser. No. 591,299
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—118

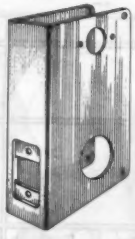
242,595
RUBBISH AND GARBAGE RECEPTACLE
Frank C. De Lise, 44B Woodcutter's Path, Nissequogue, N.Y. 11780, and Stephen W. De Lise, 106 Anchorage Drive, West Islip, N.Y. 11795
Filed May 19, 1975, Ser. No. 578,730
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



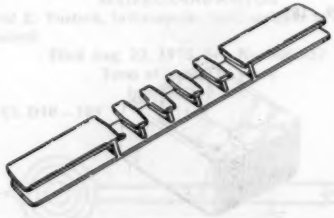
242,596
RECREATIONAL VEHICLE REFRIGERATOR DOOR LATCH OR SIMILAR ARTICLE
Donald R. Munson, 16426 RimRock Road, Apple Valley, Calif. 92307
Filed Feb. 14, 1975, Ser. No. 550,142
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—109



242,597
DOOR LATCH MECHANISM MOUNTING PLATE
Abe Gamus, Chomedey, Canada, assignor to Unican Security Systems, Ltd., Montreal, Canada
Filed Jan. 15, 1976, Ser. No. 649,359
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—137

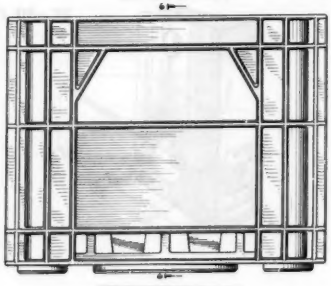


242,598
WINDING DEVICE FOR FLEXIBLE CORDS
Erich Kunstlicher, Helsingborg, Sweden, assignor to Osmos Plast Aktiebolag Corporation of Sweden, Sweden
Filed July 11, 1975, Ser. No. 595,187
Claims priority, application Sweden, Jan. 15, 1975, 7590
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—220

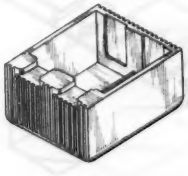


242,599
JAR
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 25, 1975, Ser. No. 599,300
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

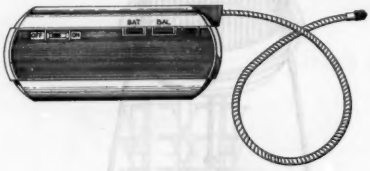
242,600
BOTTLE CRATE
Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730
Filed Apr. 14, 1975, Ser. No. 567,820
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



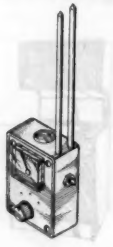
242,601
CARTRIDGE TYPE INK ROLL CASE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan
Division of Ser. No. 535,212, Dec. 23, 1974. This application Feb. 23, 1976, Ser. No. 660,352
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



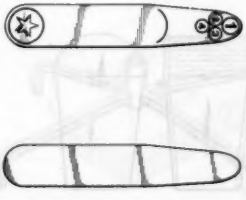
242,602
HALOGEN GAS LEAK DETECTOR
Charles A. Melvin, 5 Patricia Road, Danvers, Mass. 01923, and John F. Kain, 28 Chestnut St., Marblehead, Mass. 01945
Filed Mar. 10, 1975, Ser. No. 557,160
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



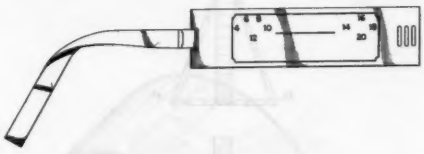
242,603
COMBINED LIGHT INTENSITY AND MOISTURE CONTENT INDICATOR
Gerald D. Horton, 1012 Mammoth Way, Placentia, Calif. 92670
Filed May 9, 1975, Ser. No. 576,161
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53



242,604
ORAL-TYPE THERMOCHROMIC FEVER INDICATOR
Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46204
Filed Jan. 10, 1975, Ser. No. 540,108
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



242,605
THERMOCHROMIC WINE BOTTLE THERMOMETER
Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46204
Filed May 30, 1975, Ser. No. 582,269
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

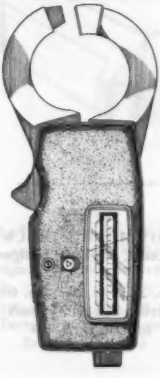


242,606
HEIGHT GAGE
Roberto Lucci, and Paolo Orlandini, both of Milan, Italy, assignors to Terraillon, Annemasse, Haute-Savoie, France
Filed July 17, 1975, Ser. No. 596,632
Claims priority, application Switzerland, Feb. 3, 1975, 60304/75
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

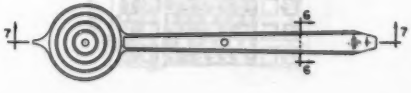
242,607
COMBINED TAPE MEASURE AND KEYCHAIN
Laird Fortune Covey, Easton, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed July 7, 1975, Ser. No. 593,312
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72

242,608
CLAMP-AROUND AMMETER-VOLTMETER
Charles A. Melvin, 5 Patricia Road, Danvers, Mass. 01923
Filed May 30, 1975, Ser. No. 582,484
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79

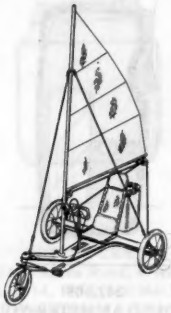
242,609
CLAMP-AROUND AMMETER-VOLTMETER
Charles A. Melvin, 5 Patricia Road, Danvers, Mass. 01923
Filed May 30, 1975, Ser. No. 582,485
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79



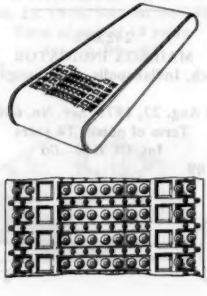
242,610
MAILBOX INDICATOR
Harold E. Voetsch, Indianapolis, Ind., assignor to Gillan and Voetsch
Filed Aug. 22, 1975, Ser. No. 606,851
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



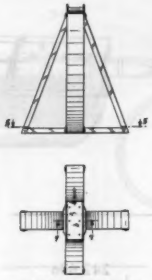
242,611
SAIL VEHICLE
Randy Schlitter, 1308 Main, Hays, Kans. 67601
Filed Sept. 17, 1975, Ser. No. 614,003
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—1



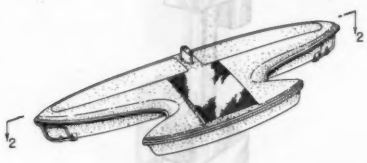
242,612
SNOWMOBILE TRACK
Jules Perreault, Valcourt, Canada, assignor to Bombardier Limited
Filed Jan. 2, 1976, Ser. No. 646,033
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



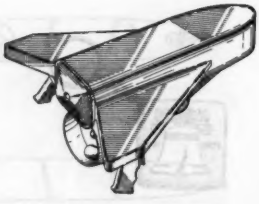
242,613
BOAT TRAILER TONGUE SUPPORT OR THE LIKE
James W. Prather, Marcum, Ky. 40963
Filed June 25, 1975, Ser. No. 590,387
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



242,614
HULL FOR A SAILBOAT
Richard Lynn Rineman, Brighton, Mich., assignor to R. Lynn Rineman; Harold J. Rineman; S. Albert Young and Benjamin W. Colman
Filed Nov. 6, 1975, Ser. No. 629,689
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64



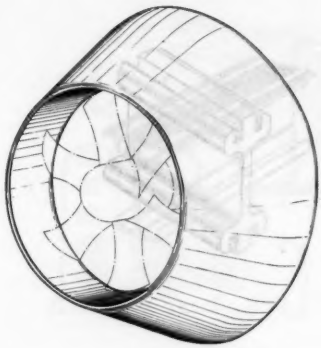
242,615
HAND-HELD UNDERWATER PROPULSION DEVICE
Andrew R. Henning, Richland, Mich., assignor to Shakespeare Company, Columbia, S.C.
Filed Sept. 22, 1975, Ser. No. 615,564
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—65



242,616
SHIP PROPELLER DUCT

Leonard Meyerhoff, and Stanley A. Meyerhoff, both of Church Street Station, Box 222, New York, N.Y. 10008

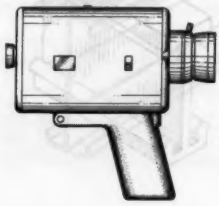
Filed Aug. 31, 1973, Ser. No. 393,644
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—214



242,617
MOTION PICTURE CAMERA

Kurt Bode, Braunschweig, and Jochen Kramer, Wolfsburg, both of Germany, assignors to Rollei-Werke Franke & Heidecke

Continuation-in-part of Ser. No. 455,868, March 28, 1974.
This application Sept. 19, 1975, Ser. No. 614,832
Claims priority, application Germany, Oct. 1, 1973, 1015; Mar. 25, 1975, 1052
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—4



242,618
FLOAT VENT VALVE

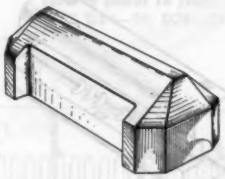
August Milo, Elizabeth, N.J., assignor to Universal Valve Company, Elizabeth, N.J.

Filed Feb. 12, 1975, Ser. No. 549,441
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

242,619
VALVE HANDLE

Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

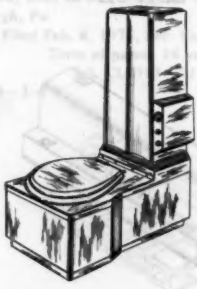
Filed Dec. 2, 1975, Ser. No. 637,085
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



242,620
INCINERATOR TOILET OR THE LIKE

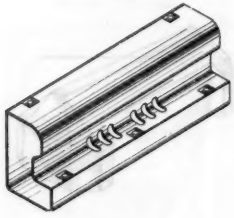
Donald P. Frankel, and Frederick S. Brennan, both of Lake Geneva, Wis., assignors to Lake Geneva A & C Corporation, Lake Geneva, Wis.

Filed Dec. 4, 1975, Ser. No. 637,725
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

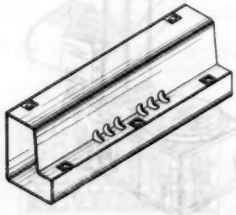


242,621
HOLDER FOR AIR FRESHENER OR THE LIKE
Frank J. Curran, Downers Grove, Ill., assignor to Frank J. Curran Company, Downers Grove, Ill.
Filed May 29, 1975, Ser. No. 581,873
Term of patent 14 years
Int. Cl. D23—*04*; D6—*04*
U.S. Cl. D23—150

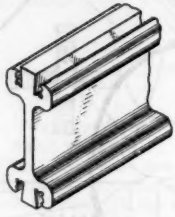
242,622
CURB AND DRAIN UNIT
Sinzo Ito, Tokyo, Japan, assignor to Sanken Steel Co., Ltd., Tokyo, Japan
Filed July 10, 1974, Ser. No. 487,361
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—73



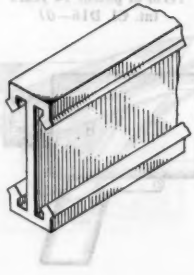
242,623
CURB AND DRAIN UNIT
Sinzo Ito, Tokyo, Japan, assignor to Sanken Steel Co., Ltd., Japan
Filed July 10, 1974, Ser. No. 487,366
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—73



242,624
PLASTIC THERMAL BARRIER FOR USE IN CONSTRUCTING THERMALLY INSULATED WINDOWS, DOORS AND/OR FRAMES AND THE LIKE
Dietrich F. Schmidt, Carlisle, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed May 27, 1975, Ser. No. 580,931
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



242,625
PLASTIC THERMAL BARRIER FOR USE IN CONSTRUCTING THERMALLY INSULATED WINDOWS, DOORS, FRAMES AND THE LIKE
Dietrich F. Schmidt, Carlisle, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed May 27, 1975, Ser. No. 580,959
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

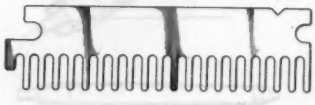


242,626
WALL STUD
Ian Scrivener, Beecroft, Australia, assignor to Comalco Products Pty. Limited, Melbourne, Australia
Filed Aug. 14, 1974, Ser. No. 497,466
Claims priority, application Australia, Apr. 26, 1974, 64841/74
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

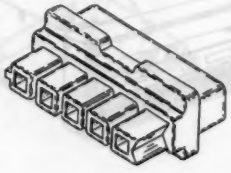
242,627
WALL STUD
Ian Scrivener, Beecroft, Australia, assignor to Comalco Products Pty. Limited, Melbourne, Australia
Filed Aug. 14, 1974, Ser. No. 497,467
Claims priority, application Australia, Apr. 26, 1974, 64842/74
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

242,628
WALL STUD
Ian Scrivener, Beecroft, Australia, assignor to Comalco Products Pty. Limited, Melbourne, Australia
Filed Aug. 14, 1974, Ser. No. 497,468
Claims priority, application Australia, Apr. 26, 1974, 64840/74
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

242,629
RADIO CHANNEL PROGRAMMING COMB
Ronald E. Cole, Columbus, and Louis E. Schonegg, Indianapolis, both of Ind., assignors to Regency Electronics, Inc.
Filed Jan. 16, 1976, Ser. No. 649,860
Term of patent 14 years
Int. Cl. D14—*99*; D28—*03*
U.S. Cl. D26—1 R

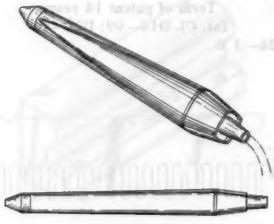


242,630
MODULAR CONNECTOR HOUSING
Wilmer Lee Sheesley, Harrisburg, and Dean Roosevelt Hooper, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburgh, Pa.
Filed Feb. 6, 1976, Ser. No. 655,643
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

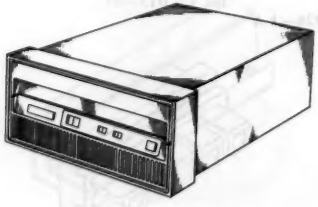


242,631
DATA PROCESSING TERMINAL
Charles F. Middleton, Jr., Sudbury, Mass., and David Roche, Nashua, N.H., assignors to Inforex, Inc., Burlington, Mass.
Filed Mar. 19, 1975, Ser. No. 559,719
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

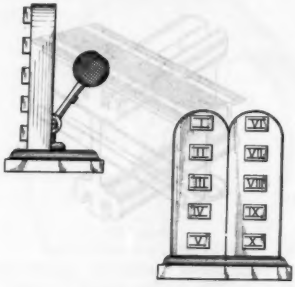
242,632
HAND-HELD DATA READER OR SIMILAR ARTICLE
Bruce M. McPherson, Ithaca, N.Y., assignor to NCR Corporation
Filed Oct. 24, 1975, Ser. No. 625,399
Term of patent 14 years
Int. Cl. D16—*06*; D19—*06*
U.S. Cl. D26—5 C



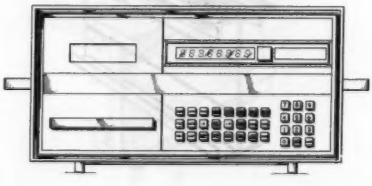
242,633
DISK DRIVE
Thomas L. Palecki, Dublin, and Robert M. Wilson, Hayward, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 19, 1975, Ser. No. 633,204
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



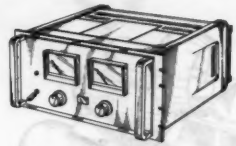
242,634
COMBINED ECCLESIASTICAL MICROPHONE AND SUPPORT THEREFOR
Casimir L. Timm, Laporte, Ind., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Mar. 10, 1975, Ser. No. 556,701
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 J

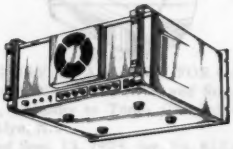


242,635
CHART RECORDING INSTRUMENT
Garry W. King, Indianapolis, Ind., and Kenneth A. Hopkins, Rochester, Mich., assignors to Esterline Angus Instrument Corporation
Filed May 16, 1975, Ser. No. 578,171
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14 C

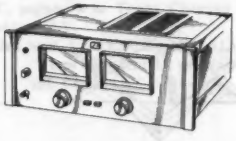


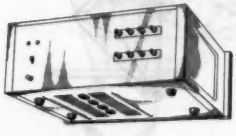
242,636
AMPLIFIER
Yoshinobu Asai, Tama, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed May 1, 1975, Ser. No. 573,671
Claims priority, application Japan, Nov. 5, 1974, 49-038697
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L





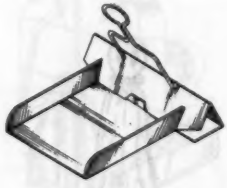
242,637
AMPLIFIER
Yoshinobu Asai, Tama, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed May 1, 1975, Ser. No. 573,672
Claims priority, application Japan, Nov. 5, 1974, 49-38696
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L



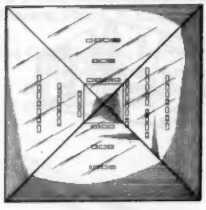


242,638
AMPLIFIER
Yoshinobu Asai, Tama, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed June 18, 1975, Ser. No. 588,110
Claims priority, application Japan, Jan. 10, 1975, 50-002040
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L

242,639
COMBINED INCENSE HOLDER AND ASH TRAY
Nanoo Patel, 1217 S. Carson Ave., Los Angeles, Calif. 90019
Filed July 23, 1975, Ser. No. 598,975
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—15

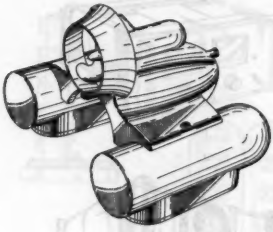


242,640
TABLE ORNAMENT
Paul P. Mosher, 5618 Bell Road NW., Parkville, Mo. 64152
Filed June 23, 1975, Ser. No. 589,126
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

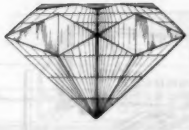


242,641
GHOST FIGURE DOLL
Julia M. Neville, 868 Ave.Ashford, Apt. 3A, Santurce, P.R. 00907
Filed Aug. 29, 1973, Ser. No. 392,504
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

242,642
BACK-SUPPORTED UNDERWATER PROPULSION DEVICE
Andrew R. Henning, Richland, Mich., assignor to Shakespeare Company, Columbia, S.C.
Filed Sept. 22, 1975, Ser. No. 615,565
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—41



242,643
DIAMOND CUT IN STARFORM
George Saltzman, Arenbergstraat 40, 2000 Anvers, Belgium
Filed Dec. 18, 1974, Ser. No. 533,825
Claims priority, application Belgium, July 30, 1974, 57
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—90



242,644
JEWELRY FINDING
George T. Spruck, 5819 Monfort Hills Ave., Cincinnati, Ohio 45239
Filed Mar. 5, 1975, Ser. No. 555,394
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—44

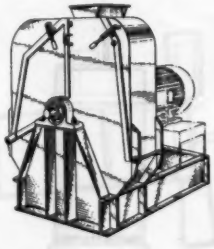
242,645
RING HAVING A MATRIX FOR CANDY
Arthur T. Shorin, New York, N.Y., and Stan Hart, Beverly Hills, Calif., assignors to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.
Filed Sept. 12, 1975, Ser. No. 613,044
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 C

242,646
COMBINED CANDY AND RING
Arthur T. Shorin, New York, N.Y., and Stan Hart, Beverly Hills, Calif., assignors to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.
Filed Sept. 12, 1975, Ser. No. 613,045
Term of patent 14 years
Int. Cl. D11—*01*; D1—*99*
U.S. Cl. D11—2

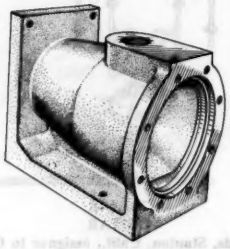
242,647
COMBINED CANDELABRA TREE STAND
James P. Van Horn, Rte. No. 2, Box 166, Mundelien, Ill. 60060
Filed Nov. 28, 1975, Ser. No. 635,572
Term of patent 14 years
Int. Cl. D26—*01*; D6—*99*
U.S. Cl. D48—2

242,648
GUITAR
Grover G. Fields, Stanton, Calif., assignor to CBS Inc., New York, N.Y.
Filed Nov. 18, 1974, Ser. No. 524,785
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

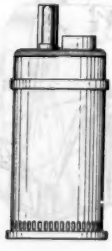
242,649
CASING AND SUPPORT CONSTRUCTION FOR A HAMMER MILL
Harry D. Schutte, Grand Island, N.Y., assignor to Schutte Pulverizer Co., Inc., Buffalo, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,228
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123



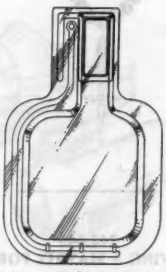
242,650
PUMP ADAPTER HOUSING
David E. McKesson, 1137 Harrison St., Walkerton, Ind. 46574
Filed May 29, 1975, Ser. No. 581,893
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—5



242,651
SUBMERSIBLE PUMP
Shinichiro Arakawa, Fujisawa, Japan, assignor to Ebara Manufacturing Co., Ltd., Tokyo, Japan
Filed July 30, 1975, Ser. No. 600,561
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

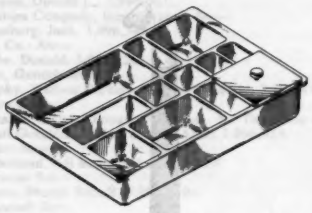


242,652
NEBULIZER BAG
George E. Kunkle, Jr., 2507 Cumberland, Mesquite, Tex. 75149
Filed Feb. 26, 1975, Ser. No. 553,337
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D83—1 N

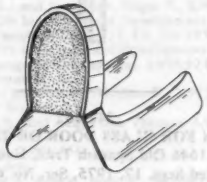


242,653
URINE METERING DEVICE
Fred Vage Gunnar Ekbladh, Saro; Tage Eriksson, Trollhattan, and Bernt Milton Herrstromer, Kullavik, all of Sweden, assignors to Astra-Sjuco AB
Filed Apr. 21, 1975, Ser. No. 569,676
Claims priority, application Sweden, Oct. 29, 1974, 741770
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 F

242,654
INTRAVENOUS INFUSION ASSIST TRAY
Norma Jean Chiera Rawls, 1409 Hardee Road, Kinston, N.C. 28501
Filed May 1, 1975, Ser. No. 573,536
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 U

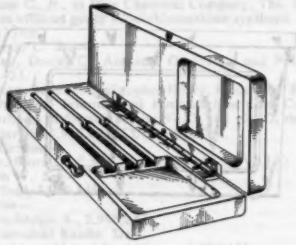


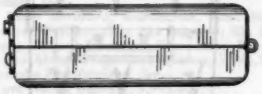
242,655
FEMALE URINARY DEVICE OR THE LIKE
J. Robert Cade, 529 NW. 58th St., Gainesville, Fla. 32601, and James D. Raulerson, Rte. 2, Box 104, Alachua, Fla. 32615
Filed May 27, 1975, Ser. No. 580,832
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U



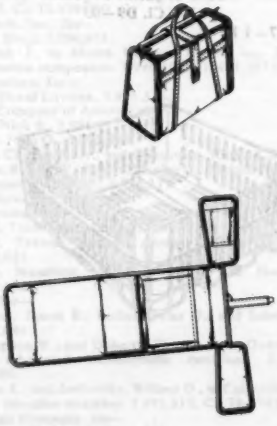
242,656
STERILIZATION INDICATOR CARD
Arthur W. Kelson, New York, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed July 21, 1975, Ser. No. 597,435
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 W

242,657
CONTAINER FOR GAME DARTS OR SIMILAR ARTICLES
Ronald A. Kurtz, Englewood, N.J., assignor to Kulite, Ridgefield, N.J.
Filed Jan. 14, 1975, Ser. No. 540,863
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

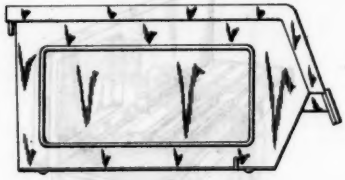


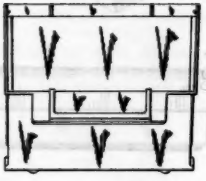


242,658
SEWING MACHINE CARRYING CASE
Donald Michaël Genaro, Haworth, N.J., and Cristian Julian Felix, Flushing, N.Y., assignors to The Singer Company
Filed May 1, 1975, Ser. No. 573,633
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

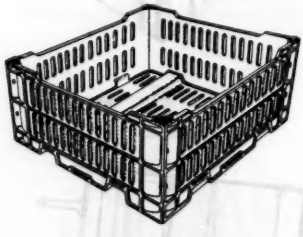


242,659
STORAGE BIN
Stuart A. Clipson, Glendale, and Jack L. Lemkin, Cincinnati, both of Ohio, assignors to Midland-Ross Corporation
Filed May 23, 1975, Ser. No. 580,219
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



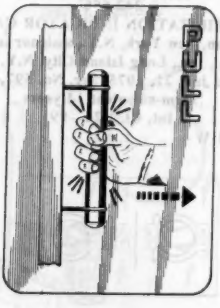


242,660
SHIPPING CONTAINER
Miles Henry Astle, London, England, assignor to John Dale Limited, London, England
Filed June 11, 1975, Ser. No. 585,950
Claims priority, application United Kingdom, Dec. 19, 1974, 969128/74
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



242,661
DISPOSABLE RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Aug. 21, 1975, Ser. No. 606,369
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

242,662
SIGN FOR GLASS DOOR OR THE LIKE
Jack Darrell, 1646 Old Spanish Trail, Houston, Tex. 77054
Filed Sept. 17, 1975, Ser. No. 614,165
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF DECEMBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Virtanen, Uolevi Eerikki, 3,995,715.

A. E. Staley Manufacturing Company: *See*—
Johnson, Donald L., 3,996,060.
Johnson, Donald L., 3,996,061.

A. H. Robins Company, Incorporated: *See*—
Greenberg, Jack, 3,996,348.

A. Stuck Co.: *See*—
Wiebe, Donald, 3,995,720.

Aaronson, Gerald: *See*—
Murphy, William D.; and Aaronson, Gerald, 3,996,418.

AB Bofors: *See*—
Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, 3,996,359.

AB Stadex: *See*—
Martensson, Kaj Bennedick, 3,996,107.

AB Stathmos: *See*—
Ekstam, Martin Rudolf, 3,995,350.

AB Tellusond: *See*—
Josefsson, Bjorn Olof; and Ahnoff, Martin, 3,996,140.

Abdallah, Abdulmunien H., to Dow Chemical Company, The. Antagonism of ethanol intoxication with 4[(4,5-dihydro-2-1H-imidazolyl)-methoxy]-N,N,2-trimethylbenzenamine. 3,996,370, Cl. 424-273.000.

Abe, Michiharu; Oride, Akiyoshi; and Okouchi, Fusakichi, to Ricoh Co., Ltd. Phase mask for use in holographic apparatus. 3,995,948, Cl. 350-3.500.

Abex Corporation: *See*—
Jones, Roger D.; and Buchholtz, Charles M., 3,995,722.

Ablad, Bengt Arne Hjalmar: *See*—
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjastrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,996,382.

Abraham, George, to United States of America, Navy. Interactive negative resistance multiple-stable state device. 3,996,484, Cl. 307-322.000.

ACF Industries, Incorporated: *See*—
Cordani, Eugene J., 3,995,564.
Coyle, Edward L.; and Josephson, Edgar F., 3,995,541.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Holders for tape cassettes. 3,995,737, Cl. 206-387.000.

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Acme Backing Corporation: *See*—
Tasch, Robert J.; and Patolia, Nitidhan P., 3,995,739.

Acquaviva, Thomas: *See*—
Hawkins, David N.; and Acquaviva, Thomas, 3,995,951.

Actron Industries, Inc.: *See*—
Froyd, Stanley G., 3,996,454.

Acushnet Company: *See*—
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,857.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,858.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,864.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,865.

Adair, Edwin L., to Medical Dynamics, Inc. Method and apparatus for retaining a drain tube within a ureter. 3,995,642, Cl. 128-349.00R.

Adams, Karl: *See*—
Gould, Russell J.; and Adams, Karl, 3,996,403.

Adams, Nellis C., to Raymond Lee Organization, Inc., The, a part interest. Valve for shutting off gas flow in pipes during earthquakes. 3,995,651, Cl. 137-38.000.

Addicks, Lyle F. Axle adjacent mounted bicycle mirror assembly. 3,995,945, Cl. 350-307.000.

Adlam, Heather Miranda, executrix: *See*—
May, George, deceased; May, Gloria Elizabeth, executrix; Adlam, Heather Miranda, executrix; and White, Desmond Devereil, 3,996,087.

Aegidius, Poul Erik, to N.K. Verwaltungs AG. Method and an apparatus for taking out an average milk sample proportional to the yield obtained in the milking of a cow. 3,995,495, Cl. 73-422.00R.

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Toone, Rodney K., 3,996,611.

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Herlem, Michel Paul; Bobillard, Francis; and Thiebault, Andre, 3,996,116.

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Matsuda, Akio, 3,996,164.

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Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, 3,996,397.

Agran, Jack: *See*—
Tavares, Robert F.; and Agran, Jack, 3,996,290.

Agricola, Manfred, to Telefonbau und Normalzeid G.m.b.H. Electronic telephone systems. 3,996,424, Cl. 179-18.00J.

Ahlstrom, Ross C., Jr., to Dow Chemical Company, The. Removal of chloral from effluent gas of 1,2-dichloroethane synthesis. 3,996,300, Cl. 260-652.00P.

Ahmann, Gerald L.: *See*—
Harrington, Daniel C.; Ahmann, Gerald L.; and Fox, John C., 3,996,451.

Ahn, Kie Yeung; Bajorek, Christopher Henry; Rosenberg, Robert; and Tu, King-Ning, to International Business Machines Corporation. Epitaxial process of forming ferrite, Fe_2O_4 and γFe_2O_3 thin films on special materials. 3,996,095, Cl. 156-610.000.

Ahnoff, Martin: *See*—
Josefsson, Bjorn Olof; and Ahnoff, Martin, 3,996,140.

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Aisin Seiki Kabushiki Kaisha: *See*—
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Ajinomoto Co., Inc.: *See*—
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Akiyama, Sumio: *See*—
Izumi, Yusuke; Akiyama, Sumio; Yamazaki, Kinya; Todo, Masato; and Tomita, Takao, 3,996,298.

Aktiebolaget Hassle: *See*—
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjastrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,996,382.

Aktiebolaget Svenska Flaktfabriken: *See*—
Karlsson, Tord Herlog Ingemar, 3,995,809.

Alberts, Albert K. Impact disintegrator. 3,995,814, Cl. 241-5.000.

Albertson, Orris E., to Envirotech Corporation. Calcium reclamation process. 3,996,133, Cl. 210-45.000.

Albrecht, Konrad: *See*—
Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, 3,996,375.

Albrecht, William P.; and Sparks, Ralph H., to United States of America, National Aeronautics and Space Administration. Fifth wheel. 3,995,877, Cl. 280-432.000.

Allard, Patrice; and Dallaire, Yvon, to Omark Industries, Inc. Guard for chain saw guide bar. 3,995,370, Cl. 30-382.000.

Allen-Bradley Company: *See*—
Grzebielski, Chester Joseph, 3,996,504.
Kuhn, Edward H., 3,995,932.

Allied Chemical Corporation: *See*—
O'Neill, Charles T.; and Steiger, Edward L., 3,996,190.
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, 3,995,788.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
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Allor, Bernard J., Jr., to Taylor & Gaskin, Inc. Conveyor stop mechanism. 3,995,561, Cl. 104-172.00S.

Almond, Barry, to Black & Decker Limited. Torque spanners. 3,995,477, Cl. 73-139.000.

Alps Motorola, Inc.: *See*—
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Alsop, Derek J., to Moore Business Forms, Inc. 2-Phenyl-1,2,3-triazolofluoran compounds. 3,996,406, Cl. 428-307.000.

Alto Corporation: *See*—
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Aluminum Company of America: *See*—
Annas, Nick S., 3,996,417.
Bowser, John O., 3,995,593.
Furney, Charles P., Jr.; and Couchman, Richard, 3,996,075.
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Amax Inc.: *See*—
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Amberg, Stephen W.; and Doherty, Thomas E., to Owens-Illinois, Inc. Nestable fabricated thermoplastic containes. 3,995,740, Cl. 206-520.000.

Amdall, John K.; and Jankovsky, William O., to Caterpillar Tractor Co. Drive line vibration absorber. 3,995,513, Cl. 74-574.000.

American Can Company: *See*—
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American Hoechst Corporation: *See—*
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American Home Products Corporation: *See—*
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American Hospital Supply Corporation: *See—*
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Clark, Robert A.; and Hall, John P., 3,995,444.

American Optical Corporation: *See—*
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Travnicek, Edward A., 3,996,189.

Ames, Ward A., to Tridan Tool & Machine, Inc. Self cleaning progressive fin die with improved stripping means. 3,995,469, Cl. 72-328.000.

Ammann, Edouard G.: *See—*
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AMP Incorporated: *See—*
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Lightner, Linn Stephen; and Classon, Edwin Oscar, 3,995,947.
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Andersen Corporation: *See—*
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Anderson, Jarl A.; Bate, Kenneth J.; Blumenthal, Victor; King, James E.; Kusekoski, Eugene F.; and Napoleone, Nunzio, to Dennison Manufacturing Company. Data collection system. 3,996,448, Cl. 235-61.60R.

Anderson, Robert V., to Producers Specialty & Mfg. Co., Inc. Adjustment assembly for shower heads. 3,995,812, Cl. 239-458.000.

Andersson, Rune Sigvard. Mouthpiece of elastic material for a drinkwater valve for cattle. 3,995,596, Cl. 119-71.000.

Andrews Paper & Chemical Co.: *See—*
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Andrews, Theodore E.: *See—*
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Annand, Robert R.: *See—*
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Annas, Nick S., to Aluminum Company of America. Cable core grip, electrical cable and connector assembly, and electrical connector kit. 3,996,417, Cl. 174-90.000.

Anton, Wolfgang Rainer; and Gebhardt, Ernst Reinhold, to Triumph Werke Nurnberg A.G. Impactless printing apparatus. 3,995,729, Cl. 197-1.00R.

Aoki, Keiji; and Goto, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Safety device for use in an apparatus for cleansing the exhaust gas in an internal combustion engine. 3,995,423, Cl. 60-288.000.

Applied Research Commodities Industries, Inc.: *See—*
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Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Temperilli, Aldemio, to Societa' Farmaceutici Italia S.p.A. Pyrimidinoaminoethyl ergoline derivatives. 3,996,228, Cl. 260-256.40C.

Arctic Pac, Inc.: *See—*
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Arick, Robert E.; and Vogel, Ralph A., to Essex International, Inc. Apparatus and method for forming dynamoelectric machine field windings by pushing. 3,995,785, Cl. 242-1.10R.

Ariyama, Kenzo: *See—*
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Aro Corporation, The: *See—*
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Artbauer, Jan; Roderburg, Harald; and Schatz, Friedrich, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Spacer construction for gas insulated high voltage cable. 3,996,414, Cl. 174-28.000.

Arthur, Jett C., Jr.: *See—*
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Asahi Glass Co., Ltd.: *See—*
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Asahi Kogaku Kogyo Kabushika Kaisha: *See—*
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Athena Industries, Inc.: *See—*
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Atkins, Thomas Joseph, to Du Pont de Nemours, E. I., and Company. Bicyclic and tricyclic phosphorous triamides. 3,996,276, Cl. 260-551.00P.

Atlantic Richfield Company: *See—*
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Attanasio, Clement Richard; and Belady, Laszlo Antal, to International Business Machines Corporation. Operating system authenticator. 3,996,449, Cl. 235-61.70R.

Atwell, Charles Gary, to Philip Morris Incorporated. Cigarette filter rod transfer apparatus having rod kinetic energy absorber. 3,995,910, Cl. 302-2.00R.

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Austin, Milton; and Kendall, Arthur G. Fishing rod support. 3,995,742, Cl. 211-60.00R.

Avco Corporation: *See—*
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Avery, Leslie Ronald, to RCA Corporation. Amplifier suitable for use as a color kinescope driver. 3,996,609, Cl. 358-30.000.

Avery Products Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 3,996,308.

AVM Corporation: *See—*
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Avsan, Oleg, to Telefonaktiebolaget L M Ericsson. Apparatus for indicating abnormal program execution in a process controlling computer operating in real time on different priority levels. 3,996,567, Cl. 340-172.500.

Axelrod, Harold: *See—*
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Aya, Masahiro; Fukazawa, Nubuo; and Kobori, Itsuro, to Bayer Aktiengesellschaft. Synergistic herbicidal compositions. 3,996,039, Cl. 71-87.000.

Aya, Masahiro; Kishino, Shigeo; Fukazawa, Nobuo; and Kume, Toyohiko, to Bayer Aktiengesellschaft. Novel amidoth ionophosphoric acid esters and their use as herbicides. 3,996,041, Cl. 71-87.000.

Ayres, Ralph E.; Cleereman, Kenneth J.; and Schrenk, Walter J., to Dow Chemical Company, The. Biaxially oriented thermoplastic container with or without molded tip periphery. 3,995,763, Cl. 220-74.000.

Ayton, Ian Frederick, to Mattel, Inc. Growth-simulating figure toy. 3,995,394, Cl. 46-119.000.

B. F. Goodrich Company, The: *See—*
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Bach, Lloyd G.; and Buente, Stephen M., to Bendix Corporation, The. Reserve system activation and modulation for hydraulic feedback brake boosters. 3,995,529, Cl. 91-28.000.

Bacher, Helmut, to Midwest Microwave, Inc. Coaxial microwave termination having rod-shaped resistive termination. 3,996,534, Cl. 333-22.00R.

Backus, Lester Frank; and Spawn, Donald Henry, to General Electric Company. Rotating hinge pin for spring loaded gear box. 3,995,509, Cl. 74-413.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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Baer, Richard I., to Wire Tester, Incorporated. Electrical wire continuity testing gun. 3,996,511, Cl. 324-51.000.

Baffico, Ann L. Moisture collector for toilet. 3,995,325, Cl. 4-1.000.

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Ahn, Kie Yeung; Bajorek, Christopher Henry; Rosenberg, Robert; and Tu, King-Ning, 3,996,095.

Baker, Maurice W.; Kerry, John C.; Kozlik, Antonin; Marshall, John R.; Nichol, Kenneth J.; and Weighton, David M., to Boots Company Limited, The. Thio derivatives of imidazol-1-yl carboxamides. 3,996,366, Cl. 424-273.000.

Baltzer, Otto J.; and Smith, Spurgeon E., to Tracor, Inc. Method for frequency cross-coupling of channels in an Omega Navigation receiver system. 3,996,515, Cl. 324-83.0FE.

Bamberger, Carlos E.; and Richardson, Donald M., to United States of America, Energy Research and Development Administration. Process for thermochemically producing hydrogen. 3,996,343, Cl. 423-657.000.

Bank of America National Trust & Savings Association: *See—*
Carlson, Alvin R., 3,995,750.

Bankaw, William Henry, to RCA Corporation. Deflection yoke having nonradial winding distribution. 3,996,542, Cl. 335-213.000.

Banks, James R. Temperature compensation control. 3,995,810, Cl. 237-8.00R.

Banks, Robert L.; and Kenton, Joseph R., to Phillips Petroleum Company. Catalysts for conversion of olefins. 3,996,166, Cl. 252-437.000.

Banks, William P.: *See—*
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Barashkov, Ruslan Yakovlevich: *See—*
Nametkin, Nikolai Sergeevich; Gubin, Sergei Pavlovich; Tjurin, Vladimir Dmitrievich; Fedorov, Viktor Viktorovich; Larionov, Leonid Ivanovich; Kozin, Vladimir Alexandrovich; Zhadanovsky, Naum Borisovich; and Barashkov, Ruslan Yakovlevich, 3,996,130.

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Barden, Wayne A.: *See—*
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Barie, Walter P., Jr.; and Franke, Norman W., to Gulf Research & Development Company. Polyepoxy resin-diaryl dianhydride laminating resins and laminates. 3,996,185, Cl. 260-32.8EP.

Barkalow, Clare E.: *See—*
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Barnes, Dwaine R.; Beyers, Marvin E.; Boundy, Donald G.; Untz, Robert W.; and Wilcox, Robert M., to Caterpillar Tractor Co. Tube-tire patch and method and apparatus for applying same. 3,996,085, Cl. 156-97.000.

Barney, Charles Azel, to Ark-Les Switch Corporation. Snap action switch. 3,996,436, Cl. 200-67.00A.

Bart, Hans U.; and Chick, Robert. Piezoelectric fuel injector valve. 3,995,813, Cl. 239-584.000.

Bartolini, Frank J. Hang glider. 3,995,799, Cl. 244-16.000.

BASF Aktiengesellschaft: *See—*
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Battarel, Claude, to Techniques et Systemes Informatiques. Reading unit for a magnetic domain propagation register on a thin layer. 3,996,575, Cl. 340-174.0TF.

Battelle Memorial Institute: *See—*
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Batyreva, Roza Petrovna: *See—*
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Bauer, Andreas; and Bluggel, Erwin, to Volkswagenwerk Aktiengesellschaft. Passive safety device for vehicles. 3,995,884, Cl. 280-745.000.

Bauer, Fritz, to Verin AG. Device for removably mounting of a length-wise-adjustable column to a chair seat, table top, or the like. 3,995,824, Cl. 248-400.000.

Bauer, Johann: *See—*
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Bauer, Klaus; and Sagmeister, Franz. Process for orally increasing the blood calcium level of animals. 3,996,351, Cl. 424-153.000.

Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Tunable optical wave guide systems. 3,995,937, Cl. 350-96.0WG.

Baur, Josef. Container for receiving an insulating or cooling medium for electrical apparatus to be tested for resistance to electrical breakdown. 3,996,512, Cl. 324-61.00P.

Baxter Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Beardmore, John M.; and Bennett, David E., to General Motors Corporation. Crosshead piston assembly. 3,995,538, Cl. 92-190.000.

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Beauchede, Jacques; and Breant, Paul, to Commissariat a l'Energie Atomique. Test rig for subjecting specimens to high temperature behavior tests. 3,996,465, Cl. 250-304.000.

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Becker, John E., to Cluaran Associates Ltd. Fluid clutches. 3,995,424, Cl. 60-349.000.

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Beecham Group Limited: *See—*
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Beecken, Hermann, to Bayer Aktiengesellschaft. Process for dyeing synthetic fibers. 3,996,000, Cl. 8-179.000.

Belady, Laszlo Antal: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Low, Arnold Edward; and Sturtevant, Michael John, 3,996,425.
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Bentley, Peter Hubert; and Clayton, John Peter, to Beecham Group Limited. 6-Isocyanato-6-substituted penicillins. 3,996,235, Cl. 260-306.70C.

Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., to Xerox Corporation. Humidity-insensitive ferrite developer materials. 3,996,392, Cl. 427-19.000.

Berg, Vernon R., Jr. Manure transfer apparatus. 3,995,734, Cl. 198-540.000.

Berger, Charles V., to Universal Oil Products Company. Fractionation of aromatic streams. 3,996,305, Cl. 260-672.00T.

Berghgracht, Marius Leopold Hypolite. Package forming apparatus. 3,995,410, Cl. 53-159.000.

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Bernardi, Luigi: *See—*
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Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjastrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, to Aktiebolaget Hassle. Phenoxy-hydroxy-propylamines, their preparation, and method and pharmaceutical preparations for treating cardiovascular diseases. 3,996,382, Cl. 424-330.000.

Bertin, George. Three-dimensional mathematical game. 3,995,862, Cl. 273-130.0AC.

Bertrand, Raymond; Barbot, Claude; and Guilhermic, Robert, to Deere & Company. Yieldable shear bar for a forage harvester. 3,995,783, Cl. 241-222.000.

Besson, Yves; and Oriol, Francois, to Thomson-CSF. System for automatic frequency control. 3,996,588, Cl. 343-7.00A.

Beyer, Norman S.; Lewis, Robert N.; and Perry, Ronald B., to United States of America, Energy Research and Development Administration. Dry, portable calorimeter for nondestructive measurement of the activity of nuclear fuel. 3,995,485, Cl. 73-190.00R.

Beyers, Marvin E.: *See—*
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Biach Industries, Inc.: *See—*
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Bice, Harold C.; Bro, Manville I.; and Dalton, John R., to Du Pont de Nemours, E. I., and Company. Propellant grain with alternating layers of encapsulated fuel and oxidizer. 3,995,559, Cl. 102-100.000.

Bickford, Albert G. Disposable mouth guard for pipettes. 3,995,496, Cl. 73-425.600.

Bikel, Hans: *See—*
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Bini, Dante. Method for making domed skeletal structures of concrete. 3,996,320, Cl. 264-32.000.

Binninger, Michael B. Apparatus for automatic woodsplitting. 3,995,672, Cl. 144-193.00A.

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Bishop, Arthur E. Rack and pinion steering gear automotive vehicles. 3,995,511, Cl. 74-498.000.

Bishop, Jerald W., to Gilmore-Tatge Manufacturing Co., Inc. Lateral stabilizer for dump trucks. 3,995,894, Cl. 298-10.000.

Bison-werke Bahre & Greten GmbH & Co. KG: *See—*
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Blancha, Erwin B., to General Motors Corporation. Check valve for a double action pump. 3,995,966, Cl. 417-254.000.

Blattner, Hans, to Ciba-Geigy Corporation. 2,3-Dihydro-1H-dibenz-[e,g]isoindole compounds. 3,996,373, Cl. 424-274.000.

Blickman, Bernard. Board game apparatus. 3,995,704, Cl. 273-131.00B.

Blucher, Joseph T.; and Evancic, Ernest A., to Wallace-Murray Corporation. Replaceable insert for agricultural disc. 3,995,699, Cl. 172-719.000.

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Board, Ralph, to Northrop Corporation. Three phase primary power regulator. 3,996,508, Cl. 323-6.000.

Bobeck, Andrew Henry; McGahey, Bruce Hamilton; Melbert, William Martin, Jr.; Prince, Terry Brice; and Stevenson, Martin James, to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Magnetic bubble, field-access assembly. 3,996,574, Cl. 340-174.0TF.

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Bond, Donald Spencer, to RCA Corporation. Method of storing spare satellites in orbit. 3,995,801, Cl. 244-158.000.

Bond, Robert M. Knockdown saw horse with clamp type legs. 3,995,716, Cl. 182-186.000.

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Borel, Joseph; Dargent, Bruno; Labrunie, Guy; and Robert, Jacques, to Commissariat a l'Energie Atomique. Method for controlling an optical characteristic of a material and an analog imager for carrying out said method. 3,995,939, Cl. 350-160.0LC.

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Boyle, George W. Lock for a gear shift. 3,995,462, Cl. 70-247.000.
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Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, to AB Bofors. Novel stereoisomeric component A of stereoisomeric mixtures of 2'-unsymmetrical 16,17-methylenedioxy steroid 21-acylates, compositions thereof, and method of treating therewith. 3,996,359, Cl. 424-241.000.
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Breitenstein, Richard C.; and Kuhl, Bernard A., to General Motors Corporation. Scraper bowl with movable floor section. 3,995,383, Cl. 37-126.0AE.
Breslow, David Samuel; and Chadwick, Arthur A., to Hercules Incorporated. Plant virus treatment. 3,996,347, Cl. 424-78.000.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 3-Heterothio derivatives of (formylamino)acetylamino-7-alpha-methoxy cephalosporins. 3,996,216, Cl. 260-243.00C.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 3-Triazolylthio derivatives of ureido cephalosporins. 3,996,217, Cl. 260-243.00C.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Oxopyridazinylthiomethyl derivatives of ureidocephalosporins. 3,996,218, Cl. 260-243.00C.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 3-Heterothio derivatives of (α-thiocarbonylamino) cephalosporins. 3,996,219, Cl. 260-243.00C.
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Broder, Jacob D., to United States of America, National Aeronautics and Space Administration. Silicon nitride coated, plastic covered solar cell. 3,996,067, Cl. 136-89.000.
Broderick, John P.; and Lyons, John E., to Eutectic Corporation. Nozzle for depositing metal powder by spraying. 3,995,811, Cl. 239-85.000.
Brodeur, Lester R.; Maben, James W.; and Parkinson, E. H., to Sanders Associates, Inc. Hard copy tone address paging system. 3,996,581, Cl. 340-311.000.
Broecker, Bernhard; and Schardt, Richard, to Hoechst Aktiengesellschaft. Process for the manufacture of heat-curable synthetic resins which can be diluted with water and are suitable for the electrophoretic coating process. 3,996,174, Cl. 260-23.70A.
Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M. Multi-section ladder for scaling poles. 3,995,714, Cl. 182-100.000.
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Brown, Peter Thomas, to Ciba-Geigy Corporation. Antistatic surfaces. 3,996,167, Cl. 252-513.000.
Brown, Vernon Letchworth; Carrillo, Leo; and Sharma, Nawal Kishore, to Bell Telephone Laboratories, Incorporated. Circuit board contact resistance probe. 3,996,514, Cl. 324-62.000.
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Bundy, Gordon L., to Upjohn Company, The. 4-Oxa phenyl-substituted PGE compounds. 3,996,266, Cl. 260-473.00A.
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Campbell, George T., Jr.; and Sherlock, Thomas P., to Westinghouse Electric Corporation. Turbine rotor disc having ultrasonic inspection surface thereon. 3,995,968, Cl. 403-356.000.

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Carpenter, Frederick H.; and Busse, Wolf-Dieter, to University of California, The Regents of the. Cross-linking reagent for insulin synthesis. 3,996,268, Cl. 260-479.00S.

Carr, John S.; and Pelton, George, to Hydro-Dredge Accessory Co. Dredge floating pontoon pipe-line joint. 3,995,889, Cl. 285-91.000.

Carrara, Marcel V., to General Electric Company. Continuous casting apparatus including Mo-Ti-Zr alloy bushing. 3,995,587, Cl. 118-405.000.

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Chaffin, John H., III, to Honeywell Inc. Photodetector-to-substrate bonds. 3,996,548, Cl. 338-15.000.

Challenge-Cook Bros., Incorporated: *See—*
Freze, Benjamin H., 3,995,988.

Chambers, Arnold, to Glass Tubes and Components Limited. Article transfer unit. 3,995,745, Cl. 214-1.0BB.

Chambers, George S., to General Electric Company. Regulator for controlling synchronous dynamoelectric machines. 3,996,507, Cl. 322-20.000.

Chambers, Warren D., to Bendix Corporation, The. Piston and extensible cylinder therefor. 3,995,721, Cl. 188-71.800.

Chanan, Henry H.: *See—*
Friedman, Lester; and Chanan, Henry H., 3,996,270.

Chandler Evans Inc.: *See—*
Fitzgerald, Robert E.; and Kampe, Robert F., 3,995,662.

Chang, David R.; and Grisik, John J., to General Electric Company. Metallic coated article with improved resistance to high temperature environmental conditions. 3,996,021, Cl. 29-194.000.

Chang, Hsu, to International Business Machines Corporation. Double layer bubble domain lattice system. 3,996,571, Cl. 340-174.0TF.

Chang, Wen-Hsuan: *See—*
Dowbenko, Rostyslaw; and Chang, Wen-Hsuan, 3,996,309.

Chapman, Joseph E., III, to Schlumberger Technology Corporation. Apparatus for protecting downhole instruments from torsional and lateral movements. 3,995,479, Cl. 73-151.000.

Chappell, George D.: *See—*
Stanford, James R.; Martin, John H.; and Chappell, George D., 3,996,135.

Charpentier, Max: *See—*
Maldonado, Paul; Charpentier, Max; and Glikmans, Georges, 3,996,106.

Chase, George Oswald, to Hoffmann-La Roche Inc. Process for preparing benzodiazepines. 3,996,209, Cl. 260-239.30D.

Chasen, Lee Richard: *See—*
Einhorn, Ruediger; and Chasen, Lee Richard, 3,995,822.

Chem. Pharmaz. Fabrik Dr. Hermann Thiemann GmbH: *See—*
Dusemund, Jurgen; and Bock, Paul Richard, 3,996,242.

Chen, Shih-Lu; and Murphy, James A., to Corning Glass Works. Method of increasing the coercivity of magnetite films. 3,996,395, Cl. 427-129.000.

Chernosky, Allen A. Vacuum cleaner attachment for rotary lawnmowers. 3,995,348, Cl. 15-328.000.

Chesebro, Robert E., Jr., to Wigwam Mills, Inc. Cushion top sock. 3,995,322, Cl. 2-239.000.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 3,995,392.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 3,995,859.

Cheslow, Ernest, to Johnson & Johnson. Diaper having tab fastener with an anchoring leg folded on bias. 3,995,639, Cl. 128-287.000.

Chevron Research Company: *See—*
Coon, Marvin D., deceased; and Coon, Phyllis B., administratrix, 3,996,024.
Edwards, Laroy H., 3,996,243.
Walker, James H., 3,996,265.

Wall, Robert G.; and Kurkov, Victor P., 3,996,248.
Chia, Tung-Yu. Active carbon and a method of preparing the same. 3,996,161, Cl. 252-428.000.
Chiba, Seiichi: *See*—
Ohshima, Iwao; Chiba, Seiichi; and Ariyama, Kenzo, 3,996,411.
Chicago Lock Co.: *See*—
Mikos, Aloysius J., 3,995,463.
Chick, Robert: *See*—
Bart, Hans U.; and Chick, Robert, 3,995,813.
Chickowski, James E., to PPG Industries, Inc. Method and apparatus for controlling glass fiber coating. 3,996,033, Cl. 65-3.00C.
Childre, Lewis, to Lew Childre & Sons, Inc. Dual motor propulsion and steering control system. 3,995,579, Cl. 115-18.00E.
Choay, Jean: *See*—
Wermuth, Camille Georges; and Choay, Jean, 3,996,231.
Choay S.A.: *See*—
Wermuth, Camille Georges; and Choay, Jean, 3,996,231.
Chong, Victor M., to Sun Ventures, Inc. Fractionation of multicomponent dimethylnaphthelenes feeds by selective crystallization. 3,996,031, Cl. 260-674.00A.
Chrysler Corporation: *See*—
Kissel, William R., 3,995,482.
Chrysler United Kingdom Limited: *See*—
Jones, Clive, 3,995,502.
Chu, Pak-Jong; and Reedyk, Cornelis Wilfred, to Northern Electric Company Limited. Multi-contact push-button switch having plural prestressed contact members designed to provide plural circuit simultaneous switching inputs. 3,996,429, Cl. 200-5.00A.
Chu, William M.; and Lee, James M., to International Business Machines Corporation. FET load gate compensator. 3,996,481, Cl. 307-262.000.
Ciba-Geigy AG: *See*—
Defago, Raymond; Schaffluetzel, Paul; and Haase, Jaroslav, 3,995,992.
Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, 3,996,191.
Ciba-Geigy Corporation: *See*—
Blattner, Hans, 3,996,373.
Brown, Peter Thomas, 3,996,167.
Buxbaum, Lothar, 3,996,201.
Dietrich, Henri; Kallen, Jorg; and Seifert, Gottfried, 3,996,291.
Fechtig, Bruno; Kocsis, Karoly; and Bikel, Hans, 3,996,208.
Green, George Edward; and Losert, Ewald, 3,996,121.
Huber-Emden, Helmut; and Schafer, Paul, 3,996,281.
Ilvespaa, Atso, 3,996,238.
Kuhne, Manfred, 3,996,254.
Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, 3,996,175.
Schreiber, Bruno; and Diethelm, Hermann, 3,996,186.
Cichy, Robert D.; Schmid, Anthony P.; and Watson, Barry, to Owens-Illinois, Inc. Magnetic mixer. 3,995,835, Cl. 259-4.00R.
Cirino, Vidabelle O.: *See*—
Rowland, Stanley P.; Cirino, Vidabelle O.; and Roberts, Earl J., 3,995,998.
Claeson, Karl Goran: *See*—
Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, 3,996,359.
Clark Equipment Company: *See*—
Holcomb, Orla L., Jr., 3,995,723.
Hoyt, Deryl R., 3,995,891.
Clark, Robert A.; and Hall, John P., to American Hospital Supply Corporation. Organ perfusion system. 3,995,444, Cl. 62-306.000.
Clarke, Amos Alexander Graham. Devices for use with stringed musical instruments. 3,995,523, Cl. 84-317.000.
Clarke & Merrifield Limited: *See*—
Clarke, Robert L., 3,995,861.
Clarke, Robert L., to Clarke & Merrifield Limited. Dart flights. 3,995,861, Cl. 273-106.50C.
Classon, Edwin Oscar: *See*—
Lightner, Linn Stephen; and Classon, Edwin Oscar, 3,995,947.
Clayton, John Peter: *See*—
Bentley, Peter Hubert; and Clayton, John Peter, 3,996,235.
Clayton Manufacturing Company: *See*—
Cline, Edwin Lee, 3,995,475.
Cleasby Mfg. Co., Inc.: *See*—
Schrader, William P., 3,995,616.
Cleereman, Kenneth J.: *See*—
Ayres, Ralph E.; Cleereman, Kenneth J.; and Schrenk, Walter J., 3,995,763.
Cline, Edwin Lee, to Clayton Manufacturing Company. Computer type brake analyzer with automatically controlled brake actuator. 3,995,475, Cl. 73-126.000.
Clipson, Stuart A.; and Day, Theodore J., to Midland-Ross Corporation. Storage bin with card holder. 3,995,385, Cl. 40-10.00R.
Clothier, Agnes, administratrix: *See*—
Frost, William F.; Kassel, Philip; and Clothier, Charles M., deceased, 3,996,520.
Clothier, Charles M., deceased: *See*—
Frost, William F.; Kassel, Philip; and Clothier, Charles M., deceased, 3,996,520.
Cluaran Associates Ltd.: *See*—
Becker, John E., 3,995,424.
Clupak, Inc.: *See*—
Groome, Ernest J., 3,995,354.
Clynes, Manfred E. Sound-producing isometric exerciser. 3,995,492, Cl. 73-379.000.
Coats & Clark, Inc.: *See*—
Einhorn, Ruediger, 3,995,820.
Einhorn, Ruediger, 3,995,821.
Coats & Clarks, Inc.: *See*—
Einhorn, Ruediger; and Chasen, Lee Richard, 3,995,822.
Cobb, William R.: *See*—
Moreland, William C., II; Cobb, William R.; and Malarkey, Terence D., 3,996,442.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., to Acushnet Company. Golf club head. 3,995,857, Cl. 273-77.00A.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., to Acushnet Company. Golf club head. 3,995,858, Cl. 273-77.00A.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., to Acushnet Company. Golf club head. 3,995,864, Cl. 273-164.000.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., to Acushnet Company. Golf club head. 3,995,865, Cl. 273-167.00F.
Coffey, John Albert, to Quantel Limited. Time base corrector. 3,996,605, Cl. 358-8.000.
Coffin, Robert E.; and Piacente, Anthony N., to Congoleum Corporation. Method for finishing resinous surface coverings. 3,996,328, Cl. 264-280.000.
Cogan, Richard M., to General Electric Company. Fabrication method and fabricated article. 3,996,019, Cl. 29-191.400.
Cohen, Marvin D. Pumicite filter aid. 3,996,158, Cl. 252-378.00R.
Cohn, Martin: *See*—
Manning, Kenzel P.; Cohn, Martin; and Lempel, Abraham, 3,996,613.
Coia, Pasco A., to General Signal Corporation. Totalizer. 3,996,453, Cl. 235-150.510.
Coldren, Kenneth M., to M & W Gear Company. Wagon tongue construction. 3,995,879, Cl. 280-489.000.
Cole, Edward L., to Texaco Inc. Process for feeding a high solids content solid fuel-water slurry to a gasifier. 3,996,026, Cl. 48-197.00R.
Colella, Donald F.; and Kaiser, Carl, to SmithKline Corporation. 3-Alkylamino-α-aminomethyl-4-hydroxybenzyl alcohols with β-adrenergic stimulant activity. 3,996,383, Cl. 424-330.000.
Colgate-Palmolive Company: *See*—
Douglas, Livingston C., 3,995,582.
Schaar, Charles H., 3,995,637.
Schaar, Charles H., 3,995,638.
Schaar, Charles H., 3,995,640.
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Common control failure alarm apparatus. 3,996,423, Cl. 179-15.0BF.
Combustion Engineering, Inc.: *See*—
Epperson, Robert Allen, 3,995,989.
Combustion Unlimited Incorporated: *See*—
Straitz, John F., III, 3,995,985.
Commissariat a l'Energie Atomique: *See*—
Beauchede, Jacques; and Breant, Paul, 3,996,465.
Borel, Joseph; Dargent, Bruno; Labrunie, Guy; and Robert, Jacques, 3,995,939.
Faugeras, Pierre; Lecocq, Alfred; and Romet, Jean-Louis, 3,996,099.
Guyon, Pierre; and Meyer, Robert, 3,995,940.
Mahe, Armel; and Jullien, Georges, 3,995,918.
Marmonier, Pierre; Mesnage, Bernard; Teulon, Jean; Vayra, Jean; and Venobre, Henri, 3,996,101.
Compagnie Generale des Asphaltes-Asphaltoc-S.A.: *See*—
Van Nechel, Roger, 3,996,401.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Sinobad, Dusan, 3,996,582.
Compak Systems, Inc.: *See*—
Penick, Ib; and Volkert, John K., 3,995,388.
Composite Structures Corporation: *See*—
Fetherston, William H.; and Teeter, Roger C., 3,995,984.
Comstedt, Tore Erik Karl, deceased; and by Martinsson, Magne Ingvar, representative, to Teknoflex Control System AB. Boat steering arrangement provided with an anti-theft lock. 3,995,576, Cl. 114-144.00R.
Concast AG: *See*—
Fekete, Kalman; Meier, Walter; and Fiala, Ferdinand, 3,995,682.
Schmid, Markus; and Bruderer, Werner, 3,995,681.
Schmid, Markus, 3,995,684.
Congoleum Corporation: *See*—
Coffin, Robert E.; and Piacente, Anthony N., 3,996,328.
Conn, William Maxwell, to Universal Oil Products Company. Precoat for permeability separation systems. 3,996,131, Cl. 210-23.00H.
Conner, Edmond E.; and Smith, James E., to Westinghouse Electric Corporation. Current transformer. 3,996,543, Cl. 336-58.000.
Connors, Janie G.: *See*—
Gardner, Elston A.; Connors, Janie G.; and Connors, John C., 3,995,598.
Connors, John C.: *See*—
Gardner, Elston A.; Connors, Janie G.; and Connors, John C., 3,995,598.
Consejo Nacional de Ciencia y Tecnologia: *See*—
de los Santos Izquierdo, Federico, 3,995,784.
Consolidation Coal Company: *See*—
Jamison, Will B., 3,995,905.
Continental Oil Company: *See*—
Leach, Bruce E.; and Starks, Charles M., 3,996,297.
Continental Scale Corporation: *See*—
Hutchinson, William Y.; and Kushmuk, Walter P., 3,995,708.

Control Data Corporation: *See—*
Harrington, Daniel C.; Ahmann, Gerald L.; and Fox, John C., 3,996,451.

Coon, Marvin D., deceased; and Coon, Phyllis B., administratrix, to Chevron Research Company. Fuel composition. 3,996,024, Cl. 44-71.000.

Coon, Phyllis B., administratrix: *See—*
Coon, Marvin D., deceased; and Coon, Phyllis B., administratrix, 3,996,024.

Cooper, Roydon B., to P_R^{31} Corporation. Filter assemblies containing coaxial bidirectional flow control and relief valves. 3,996,137, Cl. 210-130.000.

Cooprider, Rex C.; and Grogan, Richard P., to Diamond International Corporation. Liquid dispenser having deformable diaphragm type pump. 3,995,774, Cl. 222-207.000.

Coraluppi, Enzo: *See—*
Magagnoli, Remo; and Coraluppi, Enzo, 3,996.253.

Corcom, Inc.: *See—*
Neuman, Werner E., 3,996,537.

Cordani, Eugene J., to ACF Industries, Incorporated. Low level flat car. 3,995,564, Cl. 105-418.000.

Cornelius, Archie J., to Phillips Petroleum Company. Reservoir treatment by injecting mixture of CO_2 and hydrocarbon gas. 3,995,693, Cl. 166-268.000.

Cornelius Company, The: *See—*
McMillin, John R., 3,995,441.

Corning Glass Works: *See—*
Chen, Shih-Lu; and Murphy, James A., 3,996,395.

Corson, Ben B.; and Gormley, William T., to Koppers Company, Inc. Isomerization process. 3,996,249, Cl. 260-346.300.

Cortellino, Charles A.; Gipstein, Edward; Hewett, William A.; Johnson, Duane E.; and Moreau, Wayne M., to International Business Machines Corporation. Positive polymeric electron beam resists of very great sensitivity. 3,996,393, Cl. 427-43.000.

Cosenza, Frank J., to Tridair Industries. Captive panel fastener assembly. 3,995,675, Cl. 151-69.000.

Couch, Richard H.: *See—*
United States of America, National Aeronautics and Space Administration; Hearn, Chase P.; Couch, Richard H.; and Wilson, Lewis R., 3,996,532.

Couchman, Richard: *See—*
Furney, Charles P., Jr.; and Couchman, Richard, 3,996,075.

Coules, Ronald A., to Richco Plastic Company. Chassis connector and circuit board clip. 3,996,500, Cl. 317-101.0CC.

Courtot, Louis B., to Weatherhead Company, The. Tilt-responsive valve. 3,995,710, Cl. 180-104.000.

Cousino, Bernard A., to Cousino Corporation. Tape cartridge changer apparatus. 3,996,617, Cl. 360-92.000.

Cousino Corporation: *See—*
Cousino, Bernard A., 3,996,617.

Cox, Steven M., to Raymond Lee Organization, Inc., The, a part interest. Road surface deicing device. 3,995,965, Cl. 404-71.000.

Coyle, Edward L.; and Josephson, Edgar F., to ACF Industries, Incorporated. Railway hopper car having baffles decreasing load density. 3,995,541, Cl. 98-6.000.

Crawford, Virginia E. Television top protector. 3,995,674, Cl. 150-52.000.

Crawley, David Francis Charles, to Fisons Limited. Dielectric change sensing device. 3,995,488, Cl. 73-304.00C.

CRC Compagnia de Ricerca Chimica: *See—*
Kajfez, Franjo; Sunjic, Vesna; and Sunjic, Vitomir, 3,996,222.

Crose, James R.; and Hartnett, Charles A., to W. R. Grace & Co. Coating apparatus. 3,995,586, Cl. 118-317.000.

Croson, Eddie B., to United States of America, Navy. Chromium-silicon oxide thin film resistors. 3,996,551, Cl. 338-309.000.

Crouch, Ivan P., to USM Corporation. Method of assembling and embossing multiple layer workpieces. 3,996,088, Cl. 156-211.000.

Crounse, Nathan N.: *See—*
Jefferies, Patrick J.; and Crounse, Nathan N., 3,996,282.

Crowhurst, James Arthur, to Hawker Siddeley Dynamics Limited. Optical scanning system for dirigible heads. 3,995,933, Cl. 350-6.000.

Crump, Ronald Alfred; Goldie, Brian Peter Forsyth; and Thukral, Prem Sagar, to British Petroleum Company Limited, The. Polymerization catalyst. 3,996,163, Cl. 252-430.000.

CTS Corporation: *See—*
Hufford, James N.; and Barden, Wayne A., 3,996,549.

Culbertson, George S. 1-(N-dihydroxyalkyl) aminoalkylene-2-propenyl substituted hydrocarbons. 3,996,285, Cl. 260-584.00R.

Cullen, William P.; and Chafetz, Harry, to Texaco Inc. Halogenated alkenyl succinic anhydride-amine reaction product. 3,996,240, Cl. 260-326.50F.

Culver, Richard B., to Dresser Industries, Inc. Pulsed neutron generator using shunt between anode and cathode. 3,996,473, Cl. 250-501.000.

Cummins, Robert E. Football board game and teaching aid. 3,995,863, Cl. 273-134.0CF.

Curchod, Donald B.; and Borner, Wilhelm, to Norton Corporation. Wheel mounting assembly for tire balancing machine. 3,995,498, Cl. 73-480.000.

Curtice, Walter Richard, to RCA Corporation. Varactor tuning apparatus for a strip transmission line device. 3,996,529, Cl. 331-99.000.

Cutler-Hammer, Inc.: *See—*
Brown, Harry W., 3,996,431.
Selzer, Amos, 3,996,437.

Cyprane Limited: *See—*
Needham, David Alan, 3,995.625.

Cyrus, Richard; and Raschack, Manfred, to Knoll A.G. Chemische Fabriken. Piperazine compounds. 3,996,360, Cl. 424-250.000.

Dahl, Ernest A. Battery electrolyte level indicator. 3,996,579, Cl. 340-249.000.

Daidola, Ernest; and Daidola, John C. Marine life protector. 3,996,138, Cl. 210-170.000.

Daidola, John C.: *See—*
Daidola, Ernest; and Daidola, John C., 3,996,138.

Dajani, Esam Z.; and Yen, Chung H., to G. D. Searle & Co. 5-(1,1-Diphenyl-4-(cyclic amino) but-2-trans-en-1-yl)-2-alkyl-1,3,4-oxadiazoles and intermediates thereto. 3,996,214, Cl. 260-240.00R.

Dale, James A.; and Wang, Patricia C., to Dynapol Corporation. Hydroquinonoid ortho-alkylation polymers and the process of their production. 3,996,160, Cl. 252-404.000.

Dale, James A.: *See—*
Wang, Patricia C.; and Dale, James A., 3,996,198.

D'Alelio, Gaetano F., to University of Notre Dame du Lac. Polyimide-metallo-phthalocyanines and their preparation. 3,996,196, Cl. 260-47.0CP.

Dallaire, Yvon: *See—*
Allard, Patrice; and Dallaire, Yvon, 3,995,370.

Dalton, John R.: *See—*
Bice, Harold C.; Bro, Manville I.; and Dalton, John R., 3,995.559.

D'Amico, William P., Jr., to United States of America, Army. Apparatus for stabilizing a liquid filled artillery projectile. 3,995,550, Cl. 102-66.000.

Dana Corporation: *See—*
Geraci, Wayne A.; and Stoneman, William C., 3,995,878.

Danfoss A/S: *See—*
von Huth Smith, Ulf Martin, 3,995,533.

Darda, Helmut. Rock-splitting apparatus. 3,995,906, Cl. 299-22.000.

Dargent, Bruno: *See—*
Borel, Joseph; Dargent, Bruno; Labrunie, Guy; and Robert, Jacques, 3,995,939.

Darm, William J. Air-to-air heat exchanger. 3,995,688, Cl. 165-165.000.

Darnell, Eula K. Mathematics visual teaching aid. 3,995,378, Cl. 35-31.00B.

Daumas, Jean-Calude, to Rhone-Progil. Manufacture of phosgene from chlorine obtained by oxidation of hydrochloric gas and fixed on reactional chlorine exchanger masses. 3,996,273, Cl. 260-544.00K.

Daunt, John E.; and Kise, James D., to General Electric Company. Method and apparatus for heat bonding. 3,996,091, Cl. 156-285.000.

d'Auria, Luigi; and Ostrowsky, Daniel, to Thomson-CSF. Optical radiation generator electrically controlled. 3,996,526, Cl. 331-94.50S.

Davenport, John M.; and Fridrich, Elmer G., to General Electric Company. Fluorescent lamp unit having ballast resistor. 3,996,493, Cl. 315-58.000.

Davidovich, Yakov Gilievich: *See—*
Fridman, Georgy Nikolaevich; Vasiliev, Jury Nikolaevich; Fialkov, Abram Samoilovich; Davidovich, Yakov Gilievich; Gluskin, Abram Yakovlevich; Kozyrev, Anatoly Alexandrovich; Batyreva, Roza Petrovna; Kozlov, Evgeny Mikhailovich; Boiko, Anatoly Alexeevich; Kazakova, Olga Borisovna; Kalinina, Nadezhda Vasilievna; Emelyanova, Valentina Mikhailovna; and Yartsev, Igor Vyacheslavovich, 3,996,408.

Davis, Edward Frank: *See—*
Hajagos, Michael Stephen, deceased; Zeidenberg, Robert; Davis, Edward Frank; Halasz, Joseph; and Dormany, Robert, 3,995,583.

Davis, Roman: *See—*
Weinshenker, Ned M.; Bunes, Leonard A.; and Davis, Roman, 3,996,199.

Davis, Thomas G., to Xerox Corporation. Transfer corona device with adjustable shield bias. 3,996,466, Cl. 250-325.000.

Day, Theodore J.: *See—*
Clipson, Stuart A.; and Day, Theodore J., 3,995,385.

Dayco Corporation: *See—*
White, Jack D.; and Thomas, James R., 3,995,507.

de la Noceda, Joaquin Garcia: *See—*
Manfred, Ken Max; de la Noceda, Joaquin Garcia; and Ramos, Severino, 3,995,381.

De La Taille, Olivier P.; Labadie, Jean Francois; and Bernard, Armand R., to Etablissements Bertrand Faure. Cushion comprising a squab including at least two parts connected back to back. 3,995,893, Cl. 297-452.000.

DeBrunn, Albert W.; and Feist, Gregory R. Tobacco processing method. 3,995,646, Cl. 131-17.00R.

Decision Data Computer Corporation: *See—*
Romeo, Albert J.; and Sherbert, Edward G., 3,995,545.

Decker, Maurice S., to Midland-Ross Corporation. Flexible joint for conduit. 3,995,896, Cl. 285-233.000.

Decor, Jean-Pierre, to Rhone-Poulenc S.A. Process for the preparation of aliphatic dialdehydes. 3,996,292, Cl. 260-601.00R.

Deere & Company: *See—*
Bertrand, Raymond; Barbot, Claude; and Guilhermic, Robert, 3,995,783.
Burkhart, Russell D., 3,996,119.
Ernst, James Edward, 3,995,903.
Kainer, Carl Edward; and Wiegardt, Gordon K., 3,995,696.
Kittle, Carl Edwin; and Wiegardt, Gordon K., 3,995,711.
Ring, Curtis Phillip; and Hemming, Raymond John, 3,995,973.
Wagner, Joseph Francis, 3,995,755.
Wittren, Richard Arthur, 3,995,425.

Defago, Raymond; Schaffluetzel, Paul; and Haase, Jaroslav, to Ciba-Geigy AG. Transfer printing process for dyeing and printing organic material which can be dyed with cationic dyes. 3,995,992, Cl. 8-2.50R.

De Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Clutch assembly. 3,995,726, Cl. 192-106.200.

De Groef, Pierre, to N.V. Raychem S.A. Heat recoverable article. 3,995,964, Cl. 403-272.000.

DeKoning, Helen, to Lawrence Peska Associates, Inc., a part interest. Garbage vacuum compactor device. 3,995,754, Cl. 214-83.260.

Dell'Anno, Sal. Disposable pan into which pet waste can be shoveled on the street. 3,995,807, Cl. 229-38.000.

de los Santos Izquierdo, Federico, to Consejo Nacional de Ciencia y Tecnologia, a part interest. Rotary mill for micronic grinding. 3,995,784, Cl. 241-275.000.

DeLuca, John J.; and Hughes, Wayne E. Hydrogen fueled rotary engine. 3,995,600, Cl. 123-8.130.

Deluty, Michael E. Exercising device. 3,995,853, Cl. 272-132.000.

Demag Aktiengesellschaft: *See*—
Euler, Horst, 3,995,687.

Demetrescu, Mihai C., to Resonance Motors, Inc. Multiple-phase combustion engine embodying hydraulic drive. 3,995,427, Cl. 60-595.000.

Deniega, Jose Castillo, to Wesco Industries Corporation. Intermediate yarn feeding and control device. 3,995,786, Cl. 242-47.010.

Dennison Manufacturing Company: *See*—
Anderson, Jarl A.; Bate, Kenneth J.; Blumenthal, Victor; King, James E.; Kusekoski, Eugene F.; and Napoleone, Nunzio, 3,996,448.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Amino derivatives of imidazo[4,5-b]pyridines. 3,996,233, Cl. 260-295.50B.

DeRoo, Anthony M., to Dow Chemical Company, The. Antioxidants. 3,996,193, Cl. 260-45.90R.

Desormiere, Bernard: *See*—
Hepner, Georges; and Desormiere, Bernard, 3,995,936.

Despard, Victor R., III, to Kaadan, Ltd. Planter for plants. 3,995,397, Cl. 47-81.000.

Desplats, Andre Emile, to O.G.E.C. Cable traction and hoisting apparatus. 3,995,830, Cl. 254-76.000.

DeVrieze, Jerry D.: *See*—
Tomalia, Donald A.; and DeVrieze, Jerry D., 3,996,204.

Dew, Robert C., to Stratton & Terstegge Co., Inc. Corner assembly for fireplace enclosure. 3,995,612, Cl. 126-139.000.

Diamond International Corporation: *See*—
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Diamond, Julius; and Burns, Bernard J., to William H. Rorer, Inc. 1,5-Disubstituted biguanides. 3,996,232, Cl. 260-293.790.

Dick, G. John, to United States of America, Navy. Superconducting apparatus for converting microwaves into work. 3,995,433, Cl. 60-721.000.

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Diez, Adolf, to Karl Schmidt GmbH. Method of cooling piston blank molds. 3,995,680, Cl. 164-128.000.

Diez, Jerry; and Summers, Wayne B. Gatling valve. 3,995,777, Cl. 222-370.000.

Diggs, Richard E. Apparatus for uniform dispersion of digested effluent. 3,995,436, Cl. 61-13.000.

Dillon, Walter C.; and Mesecar, Roderick S., to United States of America, Navy. Magnetic tape pulse width to digital convertor. 3,996,586, Cl. 340-347.0DD.

Dingli, Paul: *See*—
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Di Paula, Vincent, Jr.; and Casseri, Joseph L., to Fire Alarm Marketing Corporation. Fire alarm and protection booth. 3,996,580, Cl. 340-304.000.

Dir, Gary A.; and Urso, Charles J., to Xerox Corporation. Exposure system. 3,995,954, Cl. 355-71.000.

Discavage, James L.; and Pepmeier, Carl R., to FMC Corporation. Strapping apparatus. 3,995,409, Cl. 53-137.000.

DiValentin, Mario Angelo, to Canadian Industries, Ltd. Metal oxide/azide gas generating compositions. 3,996,079, Cl. 149-35.000.

DiVito, Fred, to Lumex, Inc. Adjustable positioned handgrip for canes, crutches, walkers and other ambulatory aids. 3,995,650, Cl. 135-72.000.

Djorup, Robert S., to Environmental Instruments, Inc. Directional fluid flow transducer. 3,995,481, Cl. 73-189.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
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Doffe, Rene Louis. Joint for the homokynetic transmission of rotary motion between two concurrent shafts. 3,995,449, Cl. 64-20.000.

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Donahey, Alvin V., to MI[a] Corporation. Character recognition system and method. 3,996,557, Cl. 340-146.3SY.

Doorenbos, Harold E.; and Frick, Hughie R., to Dow Chemical Company, The. Perfluorinated para-diketone polymers. 3,996,200, Cl. 260-63.0HA.

Dorfman, Jack W.: *See*—
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Dorfman, Robert S.; and Dorfman, Jack W., to Serchuck, Jerome S. Ring binder. 3,995,961, Cl. 402-38.000.

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Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, to Avery Products Corporation; and Loctite Corporation, part interest to each. Anaerobic pressure sensitive adhesive composition. 3,996,308, Cl. 260-859.00R.

Douglas, Brian Neil: *See*—
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Dowbenko, Rostyslaw; and Chang, Wen-Hsuan, to PPG Industries, Inc. Stabilizers for polymeric dispersions containing masked hydroxyl groups. 3,996,309, Cl. 260-874.000.

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Dresser Industries, Inc.: *See*—
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Drewett, Glen E. Shock absorbing arrangement for a marine structure. 3,995,437, Cl. 61-86.000.

Drimmer, Bernard E. Dynamic method for enhancing effects of underwater explosions. 3,995,574, Cl. 114-20.00R.

Drobish, James Lee, to Procter & Gamble Company, The. Vaginal cavity dispensing means and method. 3,995,634, Cl. 128-260.000.

Dubois, Michel, to Linden-Alimak AB. Underground excavating machine having independently movable half-frames. 3,995,907, Cl. 299-31.000.

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Duff, Qunion R. Cattle de-horning apparatus. 3,995,369, Cl. 30-228.000.

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Dvirka, Miro; and Stewart, Keith. Incinerator and combustion air system therefor. 3,995,568, Cl. 110-8.00R.

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Dynamit Nobel Aktiengesellschaft: *See—*
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Eaton, Paul E.; and Annand, Robert R., to Petrolite Corporation. Flush mounted corrosion probe assembly for pipeline. 3,996,124, Cl. 204-195.00C.

Eberwein, Helmut; and Scherzer, Wolfgang, to Preh Elektrofeinmechanische Werke. Keyboard switch assembly having multilayer printed circuit structure. 3,996,430, Cl. 200-5.00A.

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Ecodyne Corporation: *See—*
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Edwards, James Byrd; Diehl, Francis Louvaine; and Marsan, Mario Stephen, to Procter & Gamble Company, The. Bleaching composition. 3,996,152, Cl. 252-186.000.

Edwards, Laroy H., to Chevron Research Company. Fungicidal 5-dialkylamino-4-nitrosulfonamidothiophenes. 3,996,243, Cl. 260-329.00S.

Egger-Bussing, Klaus: *See—*
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Ehlers, Klaus-Peter: *See—*
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Eigenmann, Ludwig. Light emitting marker for roadway pavements, for traffic safety. 3,996,556, Cl. 340-117.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Adjustable clamping member. 3,995,820, Cl. 248-216.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Push pin. 3,995,821, Cl. 248-216.000.

Einhorn, Ruediger; and Chasen, Lee Richard, to Coats & Clarks, Inc. Swivel hooks and method for making the same. 3,995,822, Cl. 248-304.000.

Eixenberger, Charles A., to United States of America, Navy. Multiple channel decommutator accumulator. 3,996,422, Cl. 179-15.00A.

Ek, Lars: *See—*
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Eleanor & Wilson Greatbatch Foundation: *See—*
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Electrothermal Engineering Limited: *See—*
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Elger, Gerald W.; and Kirby, Donald E., to United States of America, Interior. Synthesis of rutile from titaniferous slags. 3,996,332, Cl. 423-69.000.

El-Ghatta, Hussain; and Forrer, Johann Karl, to Inventa AG fur Forschung und Patentverwertung. Process for preparing platinum metal catalysts. 3,996,165, Cl. 252-436.000.

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Elsel, Werner; and Bohm, Franz, to Siemens Aktiengesellschaft. Holding arrangement for a low-temperature-cooled electric winding within a vacuum tank. 3,996,545, Cl. 336-92.000.

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Engel, Walter; and Cahannes, Paul, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Base fuze for a spinning projectile. 3,995,557, Cl. 102-79.000.

Engelhard Minerals & Chemicals Corporation: *See—*
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Engelhardt & Forster: *See—*
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Envirotech Corporation: *See—*
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Epperson, Robert Allen, to Combustion Engineering, Inc. Split ring burner for weld preheat. 3,995,989, Cl. 432-49.000.

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Espenscheid, Wilton F.; and Yan, Tsoung Y., to Mobil Oil Corporation. Isobutane conversion of naphtha in pretreater desulfurization. 3,996,128, Cl. 208-89.000.

Essex International, Inc.: *See—*
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Etablissements Bertrand Faure: *See—*
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Ethyl Corporation: *See—*
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Eubank, Marcus P. Reverse air cycle air conditioner. 3,995,446, Cl. 62-325.000.

Euler, Horst, to Demag Aktiengesellschaft. Water cooling system for a shaft type furnace. 3,995,687, Cl. 165-13.000.

European Atomic Energy Community (Euratom): *See—*
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Eutectic Corporation: *See—*
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Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,995,859.

Evers, William J.; Pelse, Igor A.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 3-Furyl beta-chalcogencycloaklyl sulfides. 3,996,250, Cl. 260-347.200.

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Falkenburg, Rudy Andre, to U.S. Philips Corporation. Method for the chemical conversion in gas mixtures. 3,996,339, Cl. 423-405.000.

Fang, Shou-Mean; and Hof, Craig R., to Bio-Medical Sciences, Inc. Time-temperature integrating indicator. 3,996,007, Cl. 23-253.0TP.

Farley, D. Gray. Tuna squeezer and strainer utensil. 3,995,544, Cl. 100-116.000.

Farnsworth, David L.: *See*—
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Fassbender, Charles J., to NCR Corporation. Test code generator. 3,996,612, Cl. 360-40.000.

Faugeras, Pierre; Lecocq, Alfred; and Romet, Jean-Louis, to Commissariat a l'Energie Atomique. Low temperature steam generator. 3,996,099, Cl. 176-49.000.

Fechtig, Bruno; Kocsis, Karoly; and Bikel, Hans, to Ciba-Geigy Corporation. 6-Acylamino-penam-3-carboxylic acids. 3,996,208, Cl. 260-239.100.

Fedorov, Viktor Viktorovich: *See*—
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Fedrigo, Renzo, to Ing. C. Olivetti & C., S.p.A. Apparatus for lubricating moulds for blanks. 3,995,979, Cl. 425-78.000.

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Feistel, Claude Herbert; and Gianos, Philip Theodore, to International Business Machines Corporation. Butler oscillator. 3,996,530, Cl. 331-116.00R.

Fekete, Kalman; Meier, Walter; and Fiala, Ferdinand, to Concast AG. Continuous casting apparatus with pour tube having lateral slot-like openings. 3,995,682, Cl. 164-281.00R.

Fellers, Dickie D. Weight transfer unit. 3,995,697, Cl. 172-440.000.

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Fergason, Lewis A.; and Turnbull, David R., to Monsanto Company. Apparatus for wafer probing having surface level sensing. 3,996,517, Cl. 324-158.00P.

Fetherston, William H.; and Teeter, Roger C., to Composite Structures Corporation. Matching dies for composite cored structures. 3,995,984, Cl. 425-521.000.

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Fichtel & Sachs A.G.: *See*—
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Fiedler, Louis J., to Avco Corporation. Method of producing holes in powder metallurgy parts. 3,996,048, Cl. 75-208.00R.

Figes, Victor Charles; and Bowen, Stanley Ivor, to Molins Limited. Conveyor systems for cigarettes or other similar rod-like articles. 3,995,732, Cl. 198-524.000.

Filbert, William C., Jr.; Souffie, Robert D.; and Turner, Richard M., to Du Pont de Nemours, E. I., and Company. Energy-absorbing systems. 3,995,901, Cl. 293-88.000.

Fine, David H., to Thermo Electron Corporation. Method and apparatus for measuring the n-nitroso compound content of a sample. 3,996,002, Cl. 23-230.0PC.

Fine, David H.; and Rounbehler, David P., to Thermo Electron Corporation. Specific compound detection system with liquid chromatograph. 3,996,003, Cl. 23-230.0PC.

Fine, David H.; and Rounbehler, David P., to Thermo Electron Corporation. Detection system with liquid chromatograph. 3,996,004, Cl. 23-230.0PC.

Fine, David H.; Lieb, David P.; and Rounbehler, David P., to Thermo Electron Corporation. Specific compound detection system with gas chromatograph. 3,996,008, Cl. 23-254.00R.

Fine, David H.; and Lieb, David P., to Thermo Electron Corporation. Specific compound detection system. 3,996,009, Cl. 23-254.00R.

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Di Paula, Vincent, Jr.; and Casseri, Joseph L., 3,996,580.

Firey, Joseph Carl. Gasoline engine torque regulator with speed correction. 3,995,606, Cl. 123-90.120.

Firth, Ronald R., to Eastman Kodak Company. Tape edge guide for a fully rotatable drum. 3,996,619, Cl. 360-130.000.

Fisch, Richard S.: *See*—
Santemma, Hector J.; and Fisch, Richard S., 3,996,054.

Fischer, Kurt; Steimmig, Anna; Bille, Heinz; Petersen, Harro; and Tulo, Herbert, to BASF Aktiengesellschaft. Manufacture of easy-care finishing agents for cellulosic textiles. 3,996,178, Cl. 260-29.40R.

Fischer, Kurt: *See*—
Weiner, Helmut; and Fischer, Kurt, 3,995,399.

Fischer, Paul W.; and Pye, D. Stephen, to Union Oil Company of California. Method of foam drilling using a di-substituted taurate foaming agent. 3,995,705, Cl. 175-69.000.

Fisk, James C. Small internal diameter bore gauge. 3,995,374, Cl. 33-178.00R.

Fisons Limited: *See*—
Crawley, David Francis Charles, 3,995,488.

Fitzgerald, Robert E.; and Kampe, Robert F., to Chandler Evans Inc. Fluidic switches. 3,995,662, Cl. 137-825.000.

Fitzpatrick, John W.: *See*—
Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., 3,996,392.

Fives-Cail Babcock: *See*—
Guyot, Andre; and Mulliez, Bernard, 3,995,683.

Flamand, Guy; and Billoud, Alain, to Carnaud Total Interplastic. Inspection head. 3,995,473, Cl. 73-49.200.

Flambeau Products Corporation: *See*—
Hellman, Werner, 3,995,844.

Fleck, Fritz; and Valenti, Salvatore, to Sandoz Ltd. Monobenzoxazolylstilbenes. 3,996,210, Cl. 260-240.0CA.

Fleming, Lawrence T. Flat circuit insulation stripping apparatus. 3,995,969, Cl. 408-12.000.

Fletcher, Robert L. Convertible structure. 3,995,890, Cl. 296-10.000.

Florvall, Gosta Lennart; Ross, Svante Bertil; and Ogren, Sven-Ove, to Astra Lakemedel Aktiebolag. Amphetamine derivatives. 3,996,381, Cl. 424-330.000.

Floyd, Joseph C.; and Plank, Don A., to Exxon Research and Engineering Company. Polymers containing non-extractable/non-volatile additives and processes for their preparation. 3,996,310, Cl. 260-878.00R.

Flucke, Winfried: *See*—
Wollweber, Hartmund; and Flucke, Winfried, 3,996,247.

FMC Corporation: *See*—
Discavage, James L.; and Pepmeier, Carl R., 3,995,409.
Gray, Charles A.; Berkowitz, Sidney; and Manganaro, James Lawrence, 3,996,224.
Gray, Charles A.; Berkowitz, Sidney; and Manganaro, James Lawrence, 3,996,225.
Joseph, Robert T., 3,996,108.
Lee, Nathan Dean, 3,996,341.

Foik, Adolf, to Gewerkschaft Eisenhutte Westfalia. Tube driving apparatus. 3,995,829, Cl. 254-29.00R.

Folds, Carlos D.; and Gilbert, Daniel A., to Folds, Larry J., a part interest. Inverted open channel solar heat collector panel. 3,995,804, Cl. 126-271.000.

Folds, Larry J.: *See*—
Folds, Carlos D.; and Gilbert, Daniel A., 3,995,804.

Fong, Dodd Wing: *See*—
Slovinsky, Manuel; Phillips, Kenneth G.; and Fong, Dodd Wing, 3,996,155.

Foord, Stanley George; Simpson, Walter Eric; and Martin, Peter Ivan Aitken, to International Standard Electric Corporation. Sheathed stranded cable completely filled with water blocking composition. 3,996,413, Cl. 174-23.00C.

Foralkranar AB: *See*—
Hjelm, Odd Werner, 3,995,756.

Forchini, James Franklin; and Schwinn, Joseph Michael, to Ecodyne Corporation. Fin tube seal. 3,995,332, Cl. 4-187.00R.

Fordath Limited: *See*—
Parsonage, Raymond Arthur; and Higgs, Harold, 3,995,837.

Forrer, Johann Karl: *See*—
El-Ghatta, Hussain; and Forrer, Johann Karl, 3,996,165.

Forster, Ewald: *See—*
Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, 3,996,175.
Foster Grant Co., Inc.: *See—*
Westphal, Richard C.; and Heinig, Paul, 3,996,311.
Fotre, Sandra H.; and Boeckman, Donna I. Infant bath and lounge seat. 3,995,331, Cl. 4-185.00B.
Fox, John C.: *See—*
Harrington, Daniel C.; Ahmann, Gerald L.; and Fox, John C., 3,996,451.
Fozzard, George B., to Phillips Petroleum Company. Fluoro compound preparation. 3,996,299, Cl. 260-648.00F.
Fozzard, George B., to Phillips Petroleum Company. Producing vinylidene fluoride substantially free from tetrafluoroethylene. 3,996,301, Cl. 260-653.300.
Fralick, Jack Frederick, to Kiwi Polish Company. Snap-open container. 3,995,766, Cl. 220-282.000.
Frampton, Orville D., to National Distillers and Chemical Corporation. Silica xerogel. 3,996,338, Cl. 423-335.000.
Frank W. Schaefer, Inc.: *See—*
Schaefer, Carl W. D.; Schaefer, Richard L.; and Kennedy, Gordon F., 3,996,412.
Franke, Norman W.: *See—*
Barie, Walter P., Jr.; and Franke, Norman W., 3,996,185.
Franz, John E., to Monsanto Company. Increasing sucrose content of sugar cane employing N-phenylsulfonamido-N-phosphonomethyl glycine and certain derivatives thereof. 3,996,040, Cl. 71-87.000.
Franz Morat GmbH, Firma: *See—*
Vinnemann, Antonius, 3,995,451.
Fraser-Johnston Company: *See—*
Cavezza, Norman A., 3,995,442.
Fraser, Robert B., to Searle Cardio-Pulmonary Systems Inc. Breathing gas analyzer. 3,996,010, Cl. 23-254.00E.
Freedman, Harold H.: *See—*
Lee, George A.; and Freedman, Harold H., 3,996,259.
Freiburger, Cletus N. Inflatable well seal and method of use thereof. 3,995,694, Cl. 166-285.000.
Freitag, Herbert, to Stabilus GmbH. Pneumatic spring with safety release. 3,995,842, Cl. 267-64.00R.
Frenier, Wayne W.: *See—*
Settineri, William J.; Frenier, Wayne W.; and Oswald, James H., 3,996,147.
Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, to Hoechst Aktiengesellschaft. Insecticidal composition for ultra low volume application. 3,996,375, Cl. 424-276.000.
Frenz, Norbert W.: *See—*
Mead, Ralph T.; Frenz, Norbert W.; and Rudolph, Frank W., 3,996,066.
Freund, Samuel M.; and Ritter, Joseph J., to United States of America, Commerce. Laser-induced photochemical enrichment of boron isotopes. 3,996,120, Cl. 204-157.10R.
Freze, Benjamin H., to Challenge-Cook Bros., Incorporated. Fuel saving apparatus and method for textile drying and finishing. 3,995,988, Cl. 432-21.000.
Frick, Hughie R.: *See—*
Doorenbos, Harold E.; and Frick, Hughie R., 3,996,200.
Frick, Mary A. LaRooka. Means supporting an extremity of the body during the application of a cast. 3,995,846, Cl. 269-328.000.
Fridinger, Thomas L.; Moore, George G. I.; and Lappi, Larry R., to Minnesota Mining and Manufacturing Company. 4-Methylthio-2-trifluoromethylmethanesulfonanilide and derivatives thereof. 3,996,277, Cl. 260-556.00A.
Fridman, Georgy Nikolaevich; Vasiliev, Jury Nikolaevich; Fialkov, Abram Samoilovich; Davidovich, Yakov Gilievich; Gluskin, Abram Yakovlevich; Kozyrev, Anatoly Alexandrovich; Batyreva, Roza Petrovna; Kozlov, Evgeny Mikhailovich; Boiko, Anatoly Alexeevich; Kazakova, Olga Borisovna; Kalinina, Nadezhda Vasilievna; Emelyanova, Valentina Mikhailovna; and Yartsev, Igor Vyacheslavovich. Carbon-graphite brushes for electric machines and method for manufacturing same. 3,996,408, Cl. 428-408.000.
Fridrich, Elmer G.: *See—*
Davenport, John M.; and Fridrich, Elmer G., 3,996,493.
Friebe, Walter-Gunar; Thiel, Max; Winter, Werner; Roesch, Androniki; and Schaumann, Wolfgang, to Boehringer Mannheim G.m.b.H. N⁶-Substituted-9-[3-(4-phenyl-piperazino)-propyl]-adenines. 3,996,361, Cl. 424-253.000.
Friedman, George; and Kohn, Harold B., to Lummus Company, The. Feed system for packed bed. 3,996,316, Cl. 261-96.000.
Friedman, Lester; and Chanan, Henry H., to Story Chemical Corporation. Intermediate for Gossyplure, the sex pheromone of the pink bollworm. 3,996,270, Cl. 260-488.00H.
Friedrich Vade GmbH: *See—*
Klicks, Bernhard; Dornhoff, Gunter; Stalzer, Josef; and Korner, Jorg-Peter, 3,996,071.
Frierdich, Richard D.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,995,392.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,995,859.
Fries, Bernd, to Messrs. Demag AG. Feedhead device for the moulding of plastics materials to be formed from a plurality of liquid constituents. 3,995,981, Cl. 425-242.00R.
Frischkorn, Hans: *See—*
Schinzel, Erich; Frischkorn, Hans; and Rosch, Gunter, 3,996,213.
Froggatt, Robert Justin; and Percival, William Spencer, to EMI Limited. Data acquisition in tomography. 3,996,467, Cl. 250-366.000.
Frost, Jack G.; Martin, Larry D.; and Banks, William P., to Halliburton Company. Method for removing scale from metallic substrates. 3,996,062, Cl. 134-2.000.
Frost, William F.; Kassel, Philip; and Clothier, Charles M., deceased (by Clothier, Agnes, administratrix), to Sperry Rand Corporation. Interference rejecting logarithmic receiver. 3,996,520, Cl. 325-324.000.
Froyd, Stanley G., to Actron Industries, Inc. Servomechanism monitor for numerically controlled machine tools. 3,996,454, Cl. 235-151.110.
Fuji Photo Film Co., Ltd.: *See—*
Kawaziri, Kazuhiro; Mizobuchi, Yuzo; and Tomotsu, Takeshi, 3,996,057.
Kobayashi, Teruo; Sugiyama, Masatoshi; and Sawaguchi, Hiroshi, 3,996,215.
Matsukawa, Hiroharu; Saeki, Keiso; and Watanabe, Akio, 3,996,156.
Minagawa, Yoshisato; and Okumura, Akio, 3,996,055.
Ozutsumi, Minoru; Miyazawa, Yoshihide; Motohashi, Katsuichi; Kiritani, Masatake; and Watanabe, Akio, 3,996,212.
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, to Sumitomo Chemical Company, Limited. Insecticidal esters of substituted furan methanol. 3,996,244, Cl. 260-332.20A.
Fukazawa, Nobuo: *See—*
Aya, Masahiro; Kishino, Shigeo; Fukazawa, Nobuo; and Kume, Toyohiko, 3,996,041.
Fukazawa, Nubuo: *See—*
Aya, Masahiro; Fukazawa, Nubuo; and Kobori, Itsuro, 3,996,039.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Kraft mill recovery system. 3,996,097, Cl. 162-30.00K.
Furney, Charles P., Jr.; and Couchman, Richard, to Aluminum Company of America. Method for making a heat treated aluminum alloy article. 3,996,075, Cl. 148-13.100.
Furubayashi, Hachirou: *See—*
Tamura, Junnoshin; Furubayashi, Hachirou; and Higashio, Touji, 3,995,752.
Fusey, Pierre. Basic detergent for liquid lyes. 3,996,148, Cl. 252-156.000.
G. D. Searle & Co.: *See—*
Dajani, Esam Z.; and Yen, Chung H., 3,996,214.
G. Methven & Co., Limited: *See—*
Waterston, William, 3,995,435.
Gabriel, Edwin Z. Electronic analog computers. 3,996,457, Cl. 235-184.000.
Gaeddert, Melvin V.; Hodson, Leonard W.; and Jordan, David J., to Hesston Corporation. Row unit attachment for combines. 3,995,412, Cl. 56-98.000.
GAF Corporation: *See—*
Kehoe, James W., 3,995,808.
Gamadia, Rustom Kooverji, to Lever Brothers Company. Aerosol dispensing device. 3,995,778, Cl. 222-399.000.
Ganz, William: *See—*
Blake, Lawrence W.; Lieber, Clement E.; Swan, Harold J. C.; and Ganz, William, 3,995,623.
Gardiner, Francis R.: *See—*
Murray, Jerome L.; and Gardiner, Francis R., 3,995,636.
Gardner-Denver Company: *See—*
Mayer, James R.; and Palauro, Dieter K., 3,995,700.
Gardner, Elston A.; Connors, Janie G.; and Connors, John C. Safety collar. 3,995,598, Cl. 119-106.000.
Garwood, Moody Ray. Self-cleaning bird bath. 3,995,591, Cl. 119-1.000.
Gary, Wardell; and Taylor, Glenn R., to Westinghouse Electric Corporation. Zener diode effect on long acceleration module. 3,996,499, Cl. 317-36.0TD.
Gasaway, Jack S. Coin controlled support for game net. 3,995,854, Cl. 273-29.0BB.
Gassman, Paul G., to Ohio State University Research Foundation, The. Synthesis of oxindoles from anilines and intermediates therein. 3,996,264, Cl. 260-470.000.
Gebhardt, Ernst Reinhold: *See—*
Anton, Wolfgang Rainer; and Gebhardt, Ernst Reinhold, 3,995,729.
Geluk, Ronald Jan, to N.V. Optische Industrie de Oude Delft. X-ray examination. 3,996,420, Cl. 178-6.800.
Gencarelli, Richard A.; and Wheeler, Edward L., to Uniroyal Inc. 1,5-Bis(3',5'-di-hydrocarbyl-4'-hydroxyphenyl)pentyl derivatives. 3,996,194, Cl. 260-45.85S.
General Binding Corporation: *See—*
Staats, Henry N., 3,995,886.
General Electric Company: *See—*
Backus, Lester Frank; and Spawn, Donald Henry, 3,995,509.
Brinkmann, Joseph Bernard; and Byrnes, Joseph Edward, 3,995,679.
Carrara, Marcel V., 3,995,587.
Chambers, George S., 3,996,507.
Chang, David R.; and Grisik, John J., 3,996,021.
Cogan, Richard M., 3,996,019.
Daunt, John E.; and Kise, James D., 3,996,091.
Davenport, John M.; and Fridrich, Elmer G., 3,996,493.
Griffin, James R., 3,996,434.
Guichard, Robert Charles, 3,996,510.
Hand, John D.; and Whitehouse, Wendell G., 3,996,203.
Kast, Howard B., 3,995,660.
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Nakata, Roy, 3,996,081.
Rabatin, Jacob G., 3,996,472.
Roberts, Edward H.; and Carter, Gordon V., 3,995,349.

Shaffner, Richard O.; and Smyser, William E., 3,995,928.
Stamm, Edward I., 3,995,422.
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General Foods Corporation: *See—*
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General Instrument Corporation: *See—*
Goldberg, Monroe B.; and Voorhis, William B., 3,996,602.

General Mills Chemicals, Inc.: *See—*
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General Motors Corporation: *See—*
Beardmore, John M.; and Bennett, David E., 3,995,538.
Blancha, Erwin B., 3,995,966.
Breitenstein, Richard C.; and Kuhl, Bernard A., 3,995,383.
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Ghirardi, Paul S.; Lilley, Herbert R.; and Plyler, Robert G., 3,995,929.
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Plesniarski, Edward J., 3,995,885.
Schardt, Michael M.; and Smith, John T., 3,995,914.
Shier, Richard K., 3,995,599.
Yew, Ming-Chih, 3,995,605.

General Signal Corporation: *See—*
Coia, Pasco A., 3,996,453.

Gentry, Hermond G. Marine device retrieving apparatus. 3,995,577, Cl. 114-206.00R.

Geraci, Wayne A.; and Stoneman, William C., to Dana Corporation. Aircraft towbar. 3,995,878, Cl. 280-488.000.

Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. 1-[10,11-Dihydro-dibenzo[b,f]-thiepin-10-yl]-4-(alkynylalkyl)-piperazines. 3,996,229, Cl. 260-268.0TR.

Gerot-Pharmazeutika Dr. Walter Otto K.G.: *See—*
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Schlager, Ludwig H., 3,996,279.

Gersbacher, Harry C., to United Aircraft Products, Inc. Braze fixture. 3,995,805, Cl. 228-44.10R.

Gershaw, Gerald, to Ther-A-Pedic Associates, Inc. Mattress construction. 3,995,337, Cl. 5-345.00B.

Gewerkschaft Eisenhutte Westfalia: *See—*
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Ghirardi, Paul S.; Lilley, Herbert R.; and Plyler, Robert G., to General Motors Corporation. Female terminal. 3,995,929, Cl. 339-32.00R.

Gianos, Philip Theodore: *See—*
Feistel, Claude Herbert; and Gianos, Philip Theodore, 3,996,530.

Giebel, Gerhard; and Klein, Rolf, to USM Corporation. Shoe machine. 3,995,341, Cl. 12-10.10C.

Giffin, Charles E.: *See—*
United States of America, National Aeronautics and Space Administration; Sieradski, Leonard M.; Giffin, Charles E.; and Nier, Alfred O., 3,996,464.

Gil, Jacob. Automatic continuous transmission. 3,995,709, Cl. 180-70.00R.

Gilbert, Daniel A.: *See—*
Folds, Carlos D.; and Gilbert, Daniel A., 3,995,804.

Gillette Company, The: *See—*
Hugly, Jean-Daniel, 3,996,546.

Gillette, Robert H., to Results Engineering, Inc. Honing tool slot liner and abrasive retainer. 3,995,400, Cl. 51-338.000.

Gilmore-Tatge Manufacturing Co., Inc.: *See—*
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Gipstein, Edward: *See—*
Cortellino, Charles A.; Gipstein, Edward; Hewett, William A.; Johnson, Duane E.; and Moreau, Wayne M., 3,996,393.

Girling Limited: *See—*
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Givaudan Corporation: *See—*
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Tavares, Robert F.; and Agran, Jack, 3,996,290.

Glaser, Edward L.: *See—*
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Glass Tubes and Components Limited: *See—*
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Glasser, Alfredo: *See—*
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Glasser, Alfredo; and Temperilli, Aldemio, 3,996,228.

Glassmeyer, John J.: *See—*
Vornberger, George F.; and Glassmeyer, John J., 3,995,871.

Glatzer, Stephen G. Combination subcutaneous suture remover, biopsy sampler and syringe. 3,995,619, Cl. 128-2.00B.

Glaze, Stanley George, to Lucas Aerospace Limited. Land vehicle wheel suspension arrangements. 3,995,883, Cl. 280-707.000.

Glikmans, Georges: *See—*
Maldonado, Paul; Charpentier, Max; and Glikmans, Georges, 3,996,106.

Gloeckler, Alfred Marcel, to Superba. Electric device for selecting the needles of a rectilinear knitting machine. 3,995,453, Cl. 66-75.00A.

Gluskin, Abram Yakovlevich: *See—*
Fridman, Georgy Nikolaevich; Vasiliev, Jury Nikolaevich; Fialkov, Abram Samoilovich; Davidovich, Yakov Gilievich; Gluskin, Abram Yakovlevich; Kozyrev, Anatoly Alexandrovich; Batyreva, Roza Petrovna; Kozlov, Evgeny Mikhailovich; Boiko, Anatoly Alexeevich; Kazakova, Olga Borisovna; Kalinina, Nadezhda Vasilievna; Emelyanova, Valentina Mikhailovna; and Yartsev, Igor Vyacheslavovich, 3,996,408.

Gobble, Glenn R.: *See—*
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Goeb, Andre, to Produits Chimiques Ugine Kuhlmann. Preparation of dimethylsulfoxide by liquid phase reaction of dimethysulfide and hydrogen peroxide. 3,996,295, Cl. 260-607.00D.

Goeldner, Herbert; Schmidt, Robert Rudolf; and Metzger, Carl, to Bayer Aktiengesellschaft. Synergistic herbicidal compositions. 3,996,042, Cl. 71-90.000.

Goerens, Robert L., to Uniroyal Luxembourg S.A. Ear-shaped ring travelers for yarn twisters. 3,995,419, Cl. 57-125.000.

Goldberg, Monroe B.; and Voorhis, William B., to General Instrument Corporation. Passivated and encapsulated semiconductors and method of making same. 3,996,602, Cl. 357-72.000.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy flying vehicle set. 3,995,392, Cl. 46-78.000.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Competitive board game and mechanical energy-storing catch-and-propel mechanism usable therewith. 3,995,859, Cl. 273-85.00B.

Goldie, Brian Peter Forsyth: *See—*
Crump, Ronald Alfred; Goldie, Brian Peter Forsyth; and Thukral, Prem Sagar, 3,996,163.

Goldstaub, Henry Herbert; and Morris, James Nathaniel, to Electrothermal Engineering Limited. Piglet weaning. 3,995,592, Cl. 119-16.000.

Golovko, Georgy Anatolievich; Kharitonov, Evgeny Alexandrovich; and Ignatov, Jury Yakovlevich. Process for purification of argon from oxygen. 3,996,028, Cl. 55-58.000.

Gomi, Yoshifumi: *See—*
Shimodaira, Tadayoshi; and Gomi, Yoshifumi, 3,995,547.

Goodman, James A. Net weight filler. 3,995,668, Cl. 141-34.000.

Gorbachev, Alexandr Semenovich: *See—*
Razgildeev, Gennady Innokentievich; Ekber, Boris Yakovlevich; Jurin, Petr Ipatovich; Kernichansky, Vladislav Markovich; Gorbachev, Alexandr Semenovich; Timoshenko, Grigory Markovich; Lenenko, Stanislav Antonovich; and Namleev, Valery Dmitrievich, 3,995,908.

Gorelikova, Julia Julievna: *See—*
Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,996,377.

Gorenflo, Walter C.: *See—*
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Gormley, William T.: *See—*
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Goto, Kenji: *See—*
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Gougeon, Thomas William, to Procter & Gamble Company, The. Vaginal Medicament dispensing device. 3,995,633, Cl. 128-260.000.

Gould, R. L.: *See—*
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Gould, Russell J.; and Adams, Karl, to Signode Corporation. Strapping joint and method and apparatus for forming same. 3,996,403, Cl. 428-198.000.

Graff, David F.: *See—*
Tippy, Coy M.; and Graff, David F., 3,995,899.

Graham, Robert W.; Jacobs, Stanley C.; Wickes, Henry G., Jr.; and LaCamera, Alfred F., to Aluminum Company of America. Process for producing aluminum. 3,996,117, Cl. 204-67.000.

Graning Company: *See—*
Stephens, James B., 3,995,333.

Grant, John L.: *See—*
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Gray, Charles A.; Berkowitz, Sidney; and Manganaro, James Lawrence, to FMC Corporation. Manufacture of cyanuric acid. 3,996,224, Cl. 260-248.00A.

Gray, Charles A.; Berkowitz, Sidney; and Manganaro, James Lawrence, to FMC Corporation. Manufacture of cyanuric acid. 3,996,225, Cl. 260-248.00A.

Green, George Edward; and Losert, Ewald, to Ciba-Geigy Corporation. Radiation polymerizable esters. 3,996,121, Cl. 204-159.230.

Greenberg, A. Frederick. Motion picture sound film apparatus. 3,995,946, Cl. 352-129.000.

Greenberg, Jack, to A. H. Robins Company, Incorporated. Insect-combatting device. 3,996,348, Cl. 424-78.000.

Greenhalgh, Colin William; Kenyon, Ronald Wynford; and Logan, Andrew John, to Imperial Chemical Industries Limited. Disperse dyestuff mixtures. 3,995,994, Cl. 8-26.000.

Greier, Josef: *See—*
Thien, Gerhard; Fachbach, Heinz; and Greier, Josef, 3,995,603.

Greminger, Jr., George K.; and Johnson, Earl H., to The Dow Chemical Company. Hydroxyethylmethylcellulose as a protective colloid in vinyl chloride polymerization. T953,008, 12-7-76, Cl. 526—200.

Griffin, James R., to General Electric Company. Household freezer door alarm switch having an automatic resetting deactivator. 3,996,434, Cl. 200-61.790.

Grigaitis, Benedict John; Holden, Harold William; Matts, Terrence Charles; Miskow, Maurice Henry; Richard, Jean Paul; and Seto, Philip Faut Lit, to Canadian Industries, Ltd. Stabilized air bubble-containing explosive compositions. 3,995,673, Cl. 149-21.000.

Grinshpun, Mark Izrailevich; Mironenko, Vladislav Arkhipovich; and Makarkin, Nikolai Stepanovich. Pipe cold-rolling mill. 3,995,468, Cl. 72-214.000.

Grisik, John J.: *See—*
Chang, David R.; and Grisik, John J., 3,996,021.

Grogan, John E.; and Parseghian, Gerard A., to Power Brush Inc. Rotary brush. 3,995,346, Cl. 15-182.000.

Grogan, Richard P.: *See—*
Cooprider, Rex C.; and Grogan, Richard P., 3,995,774.

Grollmusz, John. Universal spot bowling aid. 3,995,377, Cl. 35-29.00F.

Groome, Ernest J., to Clupak, Inc. Nip roll for treating web materials and method of manufacturing same. 3,995,354, Cl. 29-130.000.

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Gross, Stanley Joseph, to Biological Developments, Inc. Phenethylamine antigenic conjugates, their preparation, antibodies and use. 3,996,344, Cl. 424-1.500.

Gruetzman, Stanley A., to Andersen Corporation. Method and composition for treating substrates and coated articles obtained thereby. 3,996,410, Cl. 428-539.000.

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Gruner, Heinz Walter, to Sybron Corporation. Electromagnetic flowmeter characterized by zero quadrature signal. 3,995,484, Cl. 73-194.0EM.

Grunewald, Heinz; and Wellbrock, Jurgen, to Engelhardt & Forster. Laundry machine. 3,995,458, Cl. 68-140.000.

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Guenther, Wolfgang; Thielen, Gunter; Hackner, Hans; and Hauptstein, Friedrich Ferdinand, to BASF Aktiengesellschaft. Process and apparatus for filling foldable or rigid packages. 3,995,408, Cl. 53-126.000.

Guichard, Robert Charles, to General Electric Company. Shielding arrangement for sensing the proximity of a metallic object. 3,996,510, Cl. 324-41.000.

Guilhermic, Robert: *See—*
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Gula, John A.; Thompson, Thomas C.; Kling, John Ellis; Center, John L.; and Bodnar, Bert S., to Travenol Laboratories, Inc. Catheter insertion device. 3,995,628, Cl. 128-214.400.

Gulden, Peter, to Siemens Aktiengesellschaft. Apparatus for distributing flowing media from one flow cross section to a flow section different therefrom. 3,996,025, Cl. 48-107.000.

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Gunn, Robert D. Shaking machine. 3,995,530, Cl. 91-40.000.

Gupta, Pramod; Nast, Roland; and Windemuth, Erwin, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates of isocyanurate structure. 3,996,223, Cl. 260-248.0NS.

Gurkov, Konstantin Stepanovich: *See—*
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Gustafson, D. C.; and Skinner, F. D., to Dow Chemical Company, The. Purification of gases containing hydrogen fluoride impurity. 3,996,029, Cl. 55-71.000.

Guyon, Pierre; and Meyer, Robert, to Commissariat a l'Energie Atomique. Luminous display device. 3,995,940, Cl. 350-160.00R.

Guyot, Andre; and Mulliez, Bernard, to Fives-Cail Babcock. Continuous casting apparatus. 3,995,683, Cl. 164-282.000.

H. Bussing & Sohn: *See—*
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Haase, Jaroslav: *See—*
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Habiger, Cyril William, to Caterpillar Tractor Co. Mechanical linkage for hydrostatic control system. 3,995,426, Cl. 60-486.000.

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Hackstein, Karl-Gerhard; Hrovat, Milan; and Wolff, Willi, to Nukem G.m.b.H. Process for the production of pressed block fuel elements of high power for gas cooled high temperature reactor. 3,996,319, Cl. 264-.500.

Hagan, Paul G.; and Miner, Frend J., to United States of America, Energy Research and Development Administration. Plutonium and americium separation from salts. 3,996,331, Cl. 423-18.000.

Hager, Daniel, to Societe des Clapets T.J., Socla. Non-return valve. 3,995,658, Cl. 137-543.000.

Hahlbrock, Udo, to O & K Orenstein & Koppel Aktiengesellschaft. Device for embedding objects such as continuous pipes into water bottoms. 3,995,439, Cl. 61-72.400.

Hahn, Werner; Hennig, Walter; and Walther, Bernhard, to VEB Pentacon Dresden. Photographic cartridge camera. 3,996,597, Cl. 354-288.000.

Hahnke, Manfred; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Spin-dyeing of acrylonitrile homopolymers and copolymers. 3,996,192, Cl. 260-42.210.

Hajagos, Elizabeth Jean, executrix: *See—*
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Halasz, Joseph: *See—*
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Hall, John P.: *See—*
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Hall, Wayne C. Taper pin remover. 3,995,362, Cl. 29-257.000.

Haller, John, to Michigan Powdered Metal Products, Inc. Simultaneously expanding and contracting annular coupling device. 3,995,967, Cl. 403-370.000.

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Halstead, William S.; and Burden, Richard W., to Carrier Communication, Inc. Inductive carrier communication systems. 3,996,518, Cl. 325-54.000.

Hammack, Calvin Miles. Method and apparatus for automatically detecting and tracking moving objects and similar applications. 3,996,590, Cl. 343-112.00R.

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Hans Heinrich Auer: *See—*
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Hans Schwarzkopf GmbH: *See—*
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Harries, David Anthony, to Girling Limited. Actuator assemblies for vehicle hydraulic braking systems. 3,995,913, Cl. 303-21.00F.

Harrington, Daniel C.; Ahmann, Gerald L.; and Fox, John C., to Control Data Corporation. Semiconductor diode temperature sensing device. 3,996,451, Cl. 235-92.0MT.

Harris, Edward Bruce, to Union Carbide Corporation. Method of improving adhesion to plastic substrates. 3,996,394, Cl. 427-54.000.

Harris, George M., to Harris-Hub Company. Bed frame. 3,995,334, Cl. 5-202.000.

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Hartong, Antoon Th. A.; and Douma, Gerriet H., to United Technologies Corporation. Method for making visible defects in surfaces. 3,995,483, Cl. 73-104.000.

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Horner, Ellwood J., to American Hoechst Corporation. Apparatus for processing a printing plate. 3,995,343, Cl. 15-4.000.
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Ivester, Andrew S., to Polaroid Corporation. Photographic apparatus with extendable light tight imbibing means. 3,996,595, Cl. 354-83.000.

Ivey, John Saxon, to Borg-Warner Corporation. Automatic lubricant flow increase valve. 3,995,727, Cl. 192-113.00B.

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Jones, Allen, Jr. Semidisplacement hydrofoil ship. 3,995,575, Cl. 114-66.50H.

Jones, Charlotte B. Apparatus for sorting clothes. 3,995,924, Cl. 312-211.000.

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Kalinina, Nadezhda Vasilievna: *See—*
Fridman, Georgy Nikolaevich; Vasiliev, Jury Nikolaevich; Fialkov, Abram Samoilovich; Davidovich, Yakov Gilievich; Gluskin, Abram Yakovlevich; Kozyrev, Anatoly Alexandrovich; Batyreva, Roza Petrovna; Kozlov, Evgeny Mikhailovich; Boiko, Anatoly Alexeevich; Kazakova, Olga Borisovna; Kalinina, Nadezhda Vasilievna; Emelyanova, Valentina Mikhailovna; and Yartsev, Igor Vyacheslavovich, 3,996,408.

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Kast, Howard B., to General Electric Company. Flow metering and dividing valve. 3,995,660, Cl. 137-625.480.

Kasteler, Fred J. Apparatus for supporting a window buck frame. 3,995,843, Cl. 269-47.000.

Kato, Hisanori; and Okamoto, Hiroshi, to Nippon Tetrapod Co., Ltd.; and Palmer, Robert Q. Wave dissipating wall. 3,995,434, Cl. 61-4.000.

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Katsuta, Michitaka; and Morimoto, Kiyoaki, to Kobe Steel Ltd. Gear shaving cutter. 3,995,352, Cl. 29-103.00R.

Katzenberger, Helmut. Process for producing light weight concrete. 3,995,867, Cl. 259-148.000.

Katzer, Ernst, to Knorr-Bremse GmbH. Centering device for a rail brake magnet unit. 3,995,724, Cl. 188-165.000.

Kauffeld, Norbert M., to United States of America, Agriculture. Pollen trap with cleaning grid. 3,995,338, Cl. 6-4.00R.

Kaufman, Michael M. Transition piece for use in inflatable life rafts. 3,995,339, Cl. 9-2.00A.

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Kawakami, Hideaki; and Yoneda, Yutaka, to Hitachi, Ltd. Method of driving a matrix type liquid crystal display device. 3,995,942, Cl. 350-160.0LC.

Kawamoto, Hirohisa, to RCA Corporation. Comb filter apparatus for video playback systems. 3,996,610, Cl. 358-31.000.

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Kazakova, Olga Borisovna: *See—*
Fridman, Georgy Nikolaevich; Vasiliev, Jury Nikolaevich; Fialkov, Abram Samoilovich; Davidovich, Yakov Gilievich; Gluskin, Abram Yakovlevich; Kozyrev, Anatoly Alexandrovich; Batyreva, Roza Petrovna; Kozlov, Evgeny Mikhailovich; Boiko, Anatoly Alexeevich; Kazakova, Olga Borisovna; Kalinina, Nadezhda Vasilievna; Emelyanova, Valentina Mikhailovna; and Yartsev, Igor Vyacheslavovich, 3,996,408.

Keck, James C., to Jersey Nuclear-Avco Isotopes, Inc. Laser alteration of accommodation coefficient for isotope separation. 3,996,470, Cl. 250-423.00P.

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Keil, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of sulfonate group containing aromatic polyamides. 3,996,202, Cl. 260-78.00R.

Kelch, Heinz; Kirchgessner, Hilmar; and Schuh, Eduard, to Kienzle Apparate GmbH. Cassette for tape-shaped record carriers. 3,995,790, Cl. 242-199.000.

Keller, Klaus. Apparatus for the manufacture of reinforcement trusses. 3,996,443, Cl. 219-56.000.

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Kennedy, Gordon F.: *See—*
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Kerr, Frederic L.; and Carrigan, Carol A. Removable trash bag assembly for lawn mowers. 3,995,414, Cl. 56-202.000.

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Kessler, Clarence J., Sr. Flat-opening box. 3,995,926, Cl. 312-325.000.

Kessler, Saul, to Aidlin, Joseph W. Process for forming an anodic oxide coating on metals. 3,996,115, Cl. 204-56.00R.

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Khan, Farooq A.; and Ecklund, Leslie L., to Eaton Corporation. Hydraulic fluid pressure device and porting arrangement therefor. 3,995,978, Cl. 418-171.000.

Khan, Riaz Ahmed: *See—*
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Kimura, Yoshio; and Mitsuoka, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Vapor cooled semiconductor device having an improved structure and mounting assembly. 3,996,604, Cl. 357-82.000.

King, Albert, to J. & J. Marquardt, Firma. Electrical switch construction. 3,996,435, Cl. 200-67.00B.

King, Gerard J., to United States of America, Army. Image detector with background suppression. 3,996,599, Cl. 357-30.000.

King, James E.: *See—*
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Kinjo, Yoshimitsu, to Texas Instruments Incorporated. Motor protector apparatus. 3,996,547, Cl. 337-363.000.

Kinomoto, Shigeru; Nishikawa, Katsuyuki; and Ishida, Takao. Continuous padding type dyeing machine. 3,995,457, Cl. 68-13.00R.

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Kissel, William R., to Chrysler Corporation. Vortex swirl flowmeter sensor circuit. 3,995,482, Cl. 73-194.00B.

Kistner, Hermann. Sheet folding machine with rollers and a pocket. 3,995,849, Cl. 270-68.00A.

Kittle, Carl Edwin; and Wiegardt, Gordon K., to Deere & Company. Vehicle power steering electro-hydraulic safety backup system. 3,995,711, Cl. 180-133.000.

Kiwi Polish Company: *See—*
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Kiyohara, Takehiko: *See—*
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Klicks, Bernhard; Dornhoff, Gunter; Stalzer. Josef; and Korner, Jorg-Peter, to Friedrich Vade GmbH. Temperature measuring device for use at pressures in excess of 1,500 bar. 3,996,071, Cl. 136-233.000.

Klimashko, Vladimir Vasilievich; Tkach, Khaim Berkovich; Terin, Vladimir Maximovich; Smolyanitsky, Boris Nikolaevich; Sudnishnikov, Boris Vasilievich; Kamensky, Veniamin Viktorovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; and Tupitsyn, Konstantin Konstantinovich. Reversible pneumatic percussive device for making holes in ground by compaction. 3,995,702, Cl. 173-91.000.

Kline, George William. Lantern holder and wash pan stand device. 3,995,796, Cl. 248-121.000.

Kline, Larry H.; and Ukmar, Milosh L., to Orion Industries, Inc. Antenna with rotatable sensitivity pattern. 3,996,592, Cl. 343-817.000.

Kling, John Ellis: *See—*
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Klooze, Solomon S., to American Hoechst Corporation. 1,3-Dihydro-1'-dimethylphosphinylalkyl-3-phenylspiro(isobenzofuran)s. 3,996,354, Cl. 424-200.000.

Klomp, Edward D., to General Motors Corporation. Internal combustion engine fuel control arrangement. 3,995,609, Cl. 123-188.00S.

Klosowski, Jerome M., to Dow Corning Corporation. Low modulus room temperature vulcanizable silicone elastomer with improved slump characteristics. 3,996,184, Cl. 260-32.60R.

Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, to Dynamit Nobel Aktiengesellschaft. Explosive composition and eutectic mixture therefor. 3,996,078, Cl. 149-2.000.

Knifton, John F.; and Schwager, Irving, to Texaco Inc. Selective hydroformylation process. 3,996,293, Cl. 260-604.0HF.

Knight, Stanley Hubert, to W. Vinten Limited. Tilt mounting heads. 3,995,797, Cl. 248-184.000.

Knofel, Hartmut, to Bayer Aktiengesellschaft. Process for the production of polyamines. 3,996,283, Cl. 260-570.00D.

Knoll A.G. Chemische Fabriken: *See—*
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Kobori, Itsuro: *See—*
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Kolich, Charles H.; Braxton, Henry G., Jr.; and Lehikoinen, Urho A., to Ethyl Corporation. Halophenoxyphosphazene fire retardants. 3,996,312, Cl. 260-927.00N.

Kollmeyer, Willy D., to Shell Oil Company. Insecticidal 1-acyl-3-substituted-2-(nitro(phenylthio)-methylene)imidazolidines. 3,996,372, Cl. 424-273.000.

Komachiya, Yoshioki: *See—*
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Konomi, Tohiaki; and Machida, Tsunehiko, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Ono Sokki Seiksakusho. Device for calibrating a chassis dynamometer. 3,995,471, Cl. 73-1.00R.

Kopfer, Rudolph J. Combined mixer and applicator device. 3,995,647, Cl. 132-74.500.

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Korous, Donald J.; and Neuzil, Richard W., to UOP Inc. Aromatic hydrocarbon isomer separation process. 3,996,306, Cl. 260-674.0SA.

Koster, Waldemar; and Huber, Reinhold, to Kober AG. Sliding bearing for bridges or similar structures. 3,995,915, Cl. 308-3.00R.

Kostylev, Alexandr Dmitrievich: *See—*
Klimashko, Vladimir Vasilievich; Tkach, Khaim Berkovich; Terin, Vladimir Maximovich; Smolyanitsky, Boris Nikolaevich; Sudnishnikov, Boris Vasilievich; Kamensky, Veniamin Viktorovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; and Tupitsyn, Konstantin Konstantinovich, 3,995,702.

Kovaleski, Joseph J. Spool-handling dolly. 3,995,758, Cl. 214-330.000.

Kowal, Krzysztof; and Malone, Leon S., Jr., to Honeywell Information Systems, Inc. Priority determination apparatus for serially coupled peripheral interfaces in a data processing system. 3,996,561, Cl. 340-172.500.

Kozin, Vladimir Alexandrovich: *See—*
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Kraft, Derald H., to Aspro, Incorporated. Method of making spun V-grooved sheet metal pulleys. 3,995,474, Cl. 72-83.000.

Kreisel, Rudolf: *See—*
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Kristiansen, Henry, to Interelectric Aktiengesellschaft. Method for manufacturing a tubular-shaped multilayer coil for electrical machines. 3,995,364, Cl. 29-598.000.

Kristoffersen, Bjorn R.: *See—*
Carolan, Raymond J.; and Kristoffersen, Bjorn R., 3,995,328.

Kroffke, Kenneth K., to Houdaille Industries, Inc. Sequential lubrication distributor and lubricant injector therefor. 3,995,717, Cl. 184-7.00F.

Kronenberg, Marvin L., to Union Carbide Corporation. Nonaqueous cell utilizing a 3Me20x-based electrolyte. 3,996,069, Cl. 429-197.000.

Kronenthal, Richard L.; and Schipper, Edgar, to Ethicon, Inc. Surgical adhesives. 3,995,641, Cl. 128-335.000.

Kronman, Albert F.: *See—*
Peters, Melville F., 3,995,429.

Kruchell, George M. Golf cart seat assembly. 3,995,881, Cl. 280-646.000.

Kruishoop, Johan Christiaan Willem, to U.S. Philips Corporation. Coulometric detector. 3,996,123, Cl. 204-195.00R.

Kuhl, Bernard A.: *See—*
Breitenstein, Richard C.; and Kuhl, Bernard A., 3,995,383.

Kuhn, Edward H., to Allen-Bradley Company. Terminal for convertible contact module. 3,995,932, Cl. 339-245.000.

Kuhne, Manfred, to Ciba-Geigy Corporation. Silylated chloroacetanilides for the regulation of plant growth. 3,996,254, Cl. 260-448.20N.

Kume, Toyohiko: *See—*
Aya, Masahiro; Kishino, Shigeo; Fukazawa, Nobuo; and Kume, Toyohiko, 3,996,041.

Kumpf, Michael S.: *See—*
Miller, Harry R.; and Kumpf, Michael S., 3,995,731.

Kunisada, Masaaki; and Itou, Masao, to Aisin Seiki Kabushiki Kaisha. Hand knitting machine. 3,995,452, Cl. 66-64.000.

Kunogi, Mahito; and Oyama, Yosuke, to Kabushiki Kaisha Meiki Seisakusho. Apparatus for reclaiming and recycling thermosetting scrap. 3,995,819, Cl. 241-58.000.

Kunsman, Donald R., to Victaulic Company of America. Machine for roll grooving of pipe. 3,995,466, Cl. 72-106.000.

Kuraray Co., Ltd.: *See—*
Nomori, Hiroyuki; Kawaguchi, Takuo; Nakao, Kozo; Tanomura, Masahisa; Nishida, Takashi; Takagi, Toshiaki; and Itoi, Kazuo, 3,996,303.

Kurkov, Victor P.: *See—*
Wall, Robert G.; and Kurkov, Victor P., 3,996,248.

Kuroiwa, Sajio. Method of increasing the output of hydrogen combustion type internal combustion engine by recovery of generated heat and apparatus therefor. 3,995,421, Cl. 60-39.46R.

Kurtik, Ryan R., to Oce-van der Grinten N.V. Reproduction apparatus. 3,996,596, Cl. 354-197.000.

Kurtz, Donald R.; and Sofianek, Joseph C., to General Electric Company. Vacuum-type circuit interrupter with two sets of contacts electrically in parallel. 3,996,438, Cl. 200-144.00B.

Kuryla, Michael A. Toothbrush and toothpaste supply container. 3,995,648, Cl. 132-84.00B.

Kusekoski, Eugene F.: *See—*
Anderson, Jarl A.; Bate, Kenneth J.; Blumenthal, Victor; King, James E.; Kusekoski, Eugene F.; and Napoleone, Nunzio, 3,996,448.

Kushmuk, Walter P.: *See—*
Hutchinson, William Y.; and Kushmuk, Walter P., 3,995,708.

Kuwabara, Etsuo; Tadano, Masamitu; Horiuchi, Mitsuo; Yoda, Makoto; Ishida, Saburo; Toba, Astushi; Ohhashi, Susumu; Iwano, Yoshiro; Sasaki, Kazuo; Iwano, Mitsuo; and Tatsuno, Hiyoshi, to Nippon Oil Company Ltd.; and Tokyo Tatsuno Co., Ltd. Fuel dispensing and measuring device arranged on ground surface. 3,995,769, Cl. 222-26.000.

Kwan, Okun; and Jefferys, Robert, to Bunker Ramo Corporation. Dot matrix impact printer having retractable platen. 3,995,730, Cl. 197-127.00R.

Kyburz, Emilio: *See—*
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,996,229.

Labadie, Jean Francois: *See—*
De La Taille, Olivier P.; Labadie, Jean Francois; and Bernard, Armand R., 3,995,893.

Labbe, Francis A. M.; Preston, Edward George; Dingli, Paul; and Hirsh, Ivan Yehudi, to Molins Limited. Rod-making machines. 3,995,519, Cl. 83-310.000.

Labofina S.A.: *See—*
Hanotier, Jacques Daniel Victor, 3,996,111.

Labrunie, Guy: *See—*
Borel, Joseph; Dargent, Bruno; Labrunie, Guy; and Robert, Jacques, 3,995,939.

LaCamera, Alfred F.: *See—*
Graham, Robert W.; Jacobs, Stanley C.; Wickes, Henry G., Jr.; and LaCamera, Alfred F., 3,996,117.

Laing, Nikolaus. Thermal prime mover. 3,996,477, Cl. 290-52.000.

Lakmaker, Gerard, to I.C.M.S. Ltd. Cooling apparatus. 3,996,314, Cl. 261-30.000.

LaManna, Richard J., to Singer Company, The. Selectively bi-directional tape feed mechanism. 3,995,504, Cl. 74-143.000.

Lamberti, Vincent, to Lever Brothers Company. Ester compounds. 3,996,150, Cl. 252-162.000.

Lamparsky, Dietmar: *See—*
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,996,387.

Lancaster, Robert, to Northern Electric Company Limited. Protection circuit for telephone switching system. 3,996,426, Cl. 179-84.00A.

Land, Edwin H., to Polaroid Corporation. Whitening agents in color diffusion transfer film units. 3,996,050, Cl. 96-3.000.

Landenberger, Peter; Schuttrichkeit, Heinz; and Treutel, Georg, to Metallgesellschaft Aktiengesellschaft. Process for producing oriented continuous yarns. 3,996,324, Cl. 264-103.000.

Lange, Gunther; and Ulderup, Jurgen, to Lemforder Metallwaren AG. Slide bearing construction particularly for telescopic shaft members having universal supported joints at their respective ends. 3,995,916, Cl. 308-6.00C.

Lanier, Edward M. Super-short take off and landing apparatus. 3,995,794, Cl. 244-12.00A.

Lapp, John; and Sadler, Fred S., to McGraw-Edison Company. Capacitor with liquid polybutene dielectric. 3,996,505, Cl. 317-259.000.

Lappi, Larry R.: *See—*
Fridinger, Thomas L.; Moore, George G. I.; and Lappi, Larry R., 3,996,277.

Lardner, George E.: *See—*
Mackal, Glenn H.; Lardner, George E.; and Maz, Joseph, 3,995,653.

Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, to AGFA-GEVAERT N.V. Thermographic recording process. 3,996,397, Cl. 427-145.000.

Larionov, Leonid Ivanovich: *See—*
Nametkin, Nikolai Sergeevich; Gubin, Sergei Pavlovich; Tjurin, Vladimir Dmitrievich; Fedorov, Viktor Viktorovich; Larionov, Leonid Ivanovich; Kozin, Vladimir Alexandrovich; Zhadanovsky, Naum Borisovich; and Barashkov, Ruslan Yakovlevich, 3,996,130.

Larsen, Donald W., to W. R. Grace & Co. Polythiocarbamate monomers. 3,996,257, Cl. 260-455.00A.

Larsen, John W., to Tennessee Valley Authority. Conversion of waste rubber to fuel and other useful products. 3,996,022, Cl. 44-1.00D.

Larson, J. Frederick; and Swank, Harry R., to GTE Sylvania Incorporated. External connective means for a cathode ray tube. 3,996,491, Cl. 313-479.000.

Larsson, Stig. Cleaning tools. 3,995,345, Cl. 15-105.000.

Lasher, Edward A.: *See—*
Hong, Myung K.; Holzrichter, Edward J.; and Lasher, Edward A., 3,996,182.

Lassen, Niels, to Kefalas A/S. Alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, carboxylic acid esters thereof and acid addition salts of these compounds. 3,996,211, Cl. 260-240.0TC.

Laube, Herbert L. Energy consumption indicating system. 3,995,686, Cl. 165-11.000.

Laubscher, Hans Jorg: *See—*
Winterholler, Johann; Laubscher, Hans Jorg; Heinrich, Bernd; and Plantsch, Josef, 3,995,553.

Laur, Thomas L., to Dow Corning Corporation. Flame-retardant silicone compositions. 3,996,188, Cl. 260-37.0SB.

Lawrence, Norman F.: *See—*
Reesman, Stanley H.; and Lawrence, Norman F., 3,996,384.

Lawrence Peska Associates, Inc.: *See—*
DeKoning, Helen, 3,995,754.
Huskins, George, 3,995,445.
Johnson, Sally, 3,995,321.
Mizzi, John V., 3,995,779.

Lawson, DeWayne L.; and Roof, Raymond D., to Olinkraft, Inc. Combination shipping pallet/container. 3,995,736, Cl. 206-386.000.

Lawson, John Robert: *See—*
Leng, John Lindley; Parton, Brian; Ridyard, Denis Robert Annesley; and Lawson, John Robert, 3,996,221.

Lazzara, Anthony Ross, to Scientific Technology Incorporated. Low noise photoelectric detector apparatus. 3,996,476, Cl. 250-563.000.

Leach, Bruce E.; and Starks, Charles M., to Continental Oil Company. Process for purification of 2,6-xylenol. 3,996,297, Cl. 260-621.00B.

Lean, Eric Gung Hwa: *See—*
Blum, Joseph Martin; Lean, Eric Gung Hwa; and McGroddy, James Cleary, 3,996,528.

Leatherman, Alfred F., to Heller, William C., Jr. Composite bonding method and means. 3,996,082, Cl. 156-73.500.

Leatherman, Alfred F., to Heller, William C., Jr. Method of making container article having heatable stratified material portion. 3,996,090, Cl. 156-244.000.

Lebizay, Gerald: *See—*
Kerrigan, Michael; Lebizay, Gerald; MacSorley, Olin Lowe; and Weiss, Alfred, 3,996,564.

Lecocq, Alfred: *See—*
Faugeras, Pierre; Lecocq, Alfred; and Romet, Jean-Louis, 3,996,099.

Lederer, Gerhard, to J. G. Weisser Sohne. Automatic loading apparatus for double-spindle face lathes. 3,995,524, Cl. 82-2.700.

Lee, Chong W. High frequency, multi-throw switch employing hybrid couplers and reflection-type phase shifters. 3,996,533, Cl. 333-7.00R.

Lee, George A.; and Freedman, Harold H., to Dow Chemical Company, The. Oxidation of organic compounds by aqueous hypohalites using phase transfer catalysis. 3,996,259, Cl. 260-465.00B.

Lee, James M.: *See—*
Chu, William M.; and Lee, James M., 3,996,481.

Lee, Man Shek, to GTE Automatic Electric Laboratories Incorporated. Single amplifier network for simulating a super-inductor circuit. 3,996,539, Cl. 333-80.00R.

Lee, Nathan Dean, to FMC Corporation. Process for purifying trioctyl phosphate and use therefor. 3,996,341, Cl. 423-589.000.

Leeds and Micallef: *See—*
Micallef, Lewis A., 3,995,776.

Leeper, Harold M.: *See—*
Higuchi, Takeru; and Leeper, Harold M., 3,995,631.

Lehikoinen, Urho A.: *See—*
Kolich, Charles H.; Braxton, Henry G., Jr.; and Lehikoinen, Urho A., 3,996,312.

Leistritz, Hans Karl; and Thoma, Hans, to SIG Schweizerische Industrie-Gesellschaft. Muffler. 3,995,712, Cl. 181-53.000.

Lemforder Metallwaren AG: *See—*
Lange, Gunther; and Ulderup, Jurgen, 3,995,916.

Lemke, Timothy Allen, to AMP Incorporated. Interconnection system and method of assembly. 3,996,416, Cl. 174-68.500.

Lempel, Abraham: *See—*
Manning, Kenzel P.; Cohn, Martin; and Lempel, Abraham, 3,996,613.

Lenenko, Stanislav Antonovich: *See—*
Razgildeev, Gennady Innokentievich; Ekber, Boris Yakovlevich; Jurin, Petr Ipatovich; Kernichansky, Vladislav Markovich; Gorbachev, Alexandr Semenovich; Timoshenko, Grigory Markovich; Lenenko, Stanislav Antonovich; and Namleev, Valery Dmitrievich, 3,995,908.

Leng, John Lindley; Parton, Brian; Ridyard, Denis Robert Annesley; and Lawson, John Robert, to Imperial Chemical Industries Limited. Dyestuffs. 3,996,221, Cl. 260-246.00R.

Lesk, I. Arnold, to Motorola, Inc. Silicon manufacture. 3,996,094, Cl. 156-608.000.

Lever Brothers Company: *See—*
Gamadia, Rustom Kooverji, 3,995,778.
Lamberti, Vincent, 3,996,150.

Levsunov, Ilja. Ornamental defensive ring. 3,995,447, Cl. 63-1.00R.

Lew Childre & Sons, Inc.: *See—*
Childre, Lewis, 3,995,579.

Lewey, Ernest L.; Sharpe, Ned K.; and Sloan, James F., to Burlington Industries, Inc. Apparatus for handling large fabric rolls for slitting. 3,995,747, Cl. 214-1.00P.

Lewis, Robert N.: *See—*
Beyer, Norman S.; Lewis, Robert N.; and Perry, Ronald B., 3,995,485.

Liautaud, James P. Non-pressurized fluid product dispenser. 3,995,772, Cl. 222-83.500.

Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Toth, Erno; Toth, Laszlo; and Heltay, Imre, 3,996,038.

Lieb, David P.: *See—*
Fine, David H.; Lieb, David P.; and Rounbehler, David P., 3,996,008.
Fine, David H.; and Lieb, David P., 3,996,009.

Lieber, Clement E.: *See—*
Blake, Lawrence W.; Lieber, Clement E.; Swan, Harold J. C.; and Ganz, William, 3,995,623.

Lif-O-Gen, Inc.: *See—*
Mills, Justin W., Jr., 3,995,656.

Light, Kenneth K.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Perfume uses of tricyclic alcohols and processes. 3,996,169, Cl. 252-522.000.

Lightner, Linn Stephen; and Classon, Edwin Oscar, to AMP Incorporated. Electrical connector assembly. 3,995,947, Cl. 339-92.00M.

Lilley, Herbert R.: *See—*
Ghirardi, Paul S.; Lilley, Herbert R.; and Plyler, Robert G., 3,995,929.

Lin, Song-Ling; and Pramoda, Maturu K., to American Home Products Corporation. Permanent suspension pharmaceutical dosage form. 3,996,355, Cl. 424-228.000.

Lin, Yeong S.: *See—*
Keefe, George E.; Lin, Yeong S.; and Rosier, Laurence L., 3,996,572.

Lindblom, Marianne Gunilla; and Mogren, Hakan Lars, to SCP-exploatering AB. Process for preparing from a microbial cell mass a protein concentrate having a low nucleic acid content, and the protein concentrate thus obtained. 3,996,104, Cl. 195-5.000.

Linden-Alimak AB: *See—*
Dubois, Michel, 3,995,907.

Lingens, Paul: *See—*
Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, 3,996,078.

Lipe-Rollway Corporation: *See—*
Mead, Dennis E., 3,995,733.

List, Hans: *See—*
Thien, Gerhard; Fachbach, Heinz; and Greier, Josef, 3,995,603.

Litronix, Inc.: *See—*
Buan, Danilo P.; and Kingsbury, Richard F., 3,996,428.

LM-Electronic Luther & Maelzer: *See—*
Luther, Erich, 3,996,516.

Locke, Daniel W., to Reliance Electric Company. Self cleaning pulley for conveyor belts. 3,995,487, Cl. 74-230.000.

Lockwood, George C., to NCR Corporation. One shot multivibrator circuit. 3,996,482, Cl. 307-273.000.

Loctite Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 3,996,308.

Loev, Bernard: *See—*
Bender, Paul E.; Loev, Bernard; and Perchonock, Carl David, 3,996,364.

Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Anthelmintically active 2-carbalkoxyamino-5(6)-phenyl sulfonyloxy benzimidazoles. 3,996,368, Cl. 424-273.000.

Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Anthelmintically active 2-carbalkoxyamino benzimidazolyl-5(6)-sulfonic acid phenyl esters. 3,996,369, Cl. 424-273.000.

Loffler, Hans: *See—*
Schulze, Holger; and Loffler, Hans, 3,996,452.

Logan, Andrew John: *See—*
Greenhalgh, Colin William; Kenyon, Ronald Wynford; and Logan, Andrew John, 3,995,994.

Lombard, Claude, to Regie Nationale des Usines Renault. Multi-state semiconductor tachometer circuit. 3,996,483, Cl. 307-294.000.

Long, Robert Alvin; Over, William Roderick; and Smith, Willard Allen, to AMP Incorporated. Applicator tool for multi-conductor connector. 3,995,358, Cl. 29-203.0MW.

Loomba, Yogendra Singh: *See—*
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, 3,995,788.

Looney, John H., to Xerox Corporation. Sorter apparatus. 3,995,748, Cl. 214-6.00D.

Lorenian, Eugenia: *See—*
Lorenian, Zareh; and Lorenian, Eugenia, 3,996,176.

Lorenian, Zareh; and Lorenian, Eugenia. Method of manufacturing shaped members of synthetic thermoplastic materials free of softeners. 3,996,176, Cl. 260-28.50A.

Lorimor, Larry W.: *See—*
Junck, John A.; and Lorimor, Larry W., 3,995,532.

Losert, Ewald: *See—*
Green, George Edward; and Losert, Ewald, 3,996,121.

Lotts, Joseph E., to Toyota Motor Sales U.S.A. Inc. Shop load display system. 3,995,387, Cl. 40-64.00R.

Louis A. Grant, Inc.: *See—*
Meyers, Leo J., 3,995,344.

Low, Arnold Edward; and Sturtevant, Michael John, to Bell Telephone Laboratories, Incorporated. Call denial circuit. 3,996,425, Cl. 179-18.0DA.

Lowe, Roger W.: *See—*
Pruznick, Michael D.; Ketcham, David J.; Lowe, Roger W.; and Opittek, Eugene W., 3,996,421.

Lowther, Frank E., to Union Carbide Corporation. Corona reaction system. 3,996,122, Cl. 204-176.000.

Lowther, Frank E., to Purification Sciences, Inc. Corona generator apparatus. 3,996,474, Cl. 250-532.000.

Lucas Aerospace Limited: *See—*
Glaze, Stanley George, 3,995,883.

Luckenbach, Edward C.; and Worley, Arthur C., to Exxon Research and Engineering Company. Catalytic hydrocarbon conversion apparatus. 3,996,013, Cl. 23-288.00B.

Ludwig, George; and Walters, William J., to Bendix Corporation, The. Vacuum retard delay valve. 3,995,607, Cl. 123-117.00A.

Ludwig, Robert U., to B. F. Goodrich Company, The. Stable acrylic ester latex coating compositions. 3,996,177, Cl. 260-29.4UA.

Luebbers, Willi, to Hanns-Juergen Diederichs KG. Percussion fuse for an explosive munitions shell. 3,995,556, Cl. 102-73.00R.

Luenberger, Frederick O., to Emerson Electric Co. Means for and method of variable drive spring compensation. 3,995,505, Cl. 74-230.17A.

Lumex, Inc.: *See—*
DiVito, Fred, 3,995,650.

Lummus Company, The: *See—*
Friedman, George; and Kohn, Harold B., 3,996,316.

Lumoprint Zindler KG: *See—*
Salger, Werner, 3,995,589.

Lumpert, Jurg B.; and Ammann, Edouard G., to Palitex Project-Company G.m.b.H. Process and apparatus for counting yarn breakages. 3,995,417, Cl. 57-34.00R.

Luther, Erich, to LM-Electronic Luther & Maelzer. Apparatus and process for testing printed circuits. 3,996,516, Cl. 324-158.00F.

Lynch, Francis deS.: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,857.
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,858.
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Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis deS., 3,995,865.

Lynch, Roy Durward. Attachments for row type broadcast combines. 3,995,413, Cl. 56-119.000.

Lyons, John E.: *See—*
Broderick, John P.; and Lyons, John E., 3,995,811.

M & W Gear Company: *See—*
Coldren, Kenneth M., 3,995,879.

Maas, Michael, to Siemens Aktiengesellschaft. Installation for the processing of EKG signals. 3,995,624, Cl. 128-2.06R.

Maben, James W.: *See—*
Brodeur, Lester R.; Maben, James W.; and Parkinson, E. H., 3,996,581.

MacAskill, Donald. Heat treatment of particulate materials. 3,995,987, Cl. 432-15.000.

MacDavid, Kenton S.: *See—*
United States of America, National Aeronautics and Space Administration; Powell, Walter B.; Potter, Lee R.; and MacDavid, Kenton S., 3,996,070.

Machida, Tsunehiko: *See—*
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Mack, Charls H.: *See—*
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Mack, George: *See—*
Millar, Robert F.; and Mack, George, 3,995,753.

Mackal, Glenn H.; Lardner, George E.; and Maz, Joseph. Inflation device. 3,995,653, Cl. 137-234.000.

Mackintosh, Charles. Rail obstruction sensing means for a rail transportation system. 3,995,560, Cl. 104-1.00R.

MacSorley, Olin Lowe: *See—*
Kerrigan, Michael; Lebizay, Gerald; MacSorley, Olin Lowe; and Weiss, Alfred, 3,996,564.

Madsen, Kristian Dahl, to Allmanna Svenska Elektriska Aktiebolaget. Synchronous machine with a rated power of at least 1 MVA. 3,996,486, Cl. 310-211.000.

Maezawa, Shuji, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device of increased life expectancy. 3,995,949, Cl. 350-160.0LC.

Magagnoli, Remo; and Coraluppi, Enzo, to Minnesota Mining and Manufacturing Company. Process for the preparation of color images. 3,996,253, Cl. 260-397.70D.

Mager, Theodor: *See—*
Haus, Artur; Mager, Theodor; Pusch, Norbert; and Roseler, Wilfried, 3,996,179.

Magerlein, Barney J., to Upjohn Company, The. Aminoglycoside antibiotics and intermediates. 3,996,205, Cl. 536-17.000.

Magne, Frank C.: *See—*
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,996,353.

Mahe, Armel; and Jullien, Georges, to Commissariat a l'Energie Atomique. System for bearing a nuclear reactor vessel cooled by liquid metal. 3,995,918, Cl. 308-77.000.

Mahlein, Hans: *See—*
Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, 3,995,937.

Makarkin, Nikolai Stepanovich: *See—*
Grinshpun, Mark Izrailevich; Mironenko, Vladislav Arkhipovich; and Makarkin, Nikolai Stepanovich, 3,995,468.

Malarkey, Terence D.: *See—*
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Maldonado, Paul; Charpentier, Max; and Glikmans, Georges, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Chemical process. 3,996,106, Cl. 195-30.000.

Malkki, Yrjo; and Nikkila, Olavi Elis. Method for preventing microbial surface deterioration of foods and feeds. 3,996,386, Cl. 426-321.000.

Malmstroem, Christer Ivar: *See—*
Nordgren, Lars Carl Ernst; and Malmstroem, Christer Ivar, 3,995,622.

Malofsky, Bernard M.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 3,996,308.

Malone, Leon S., Jr.: *See—*
Kowal, Krzysztof; and Malone, Leon S., Jr., 3,996,561.

Mandel, Alan F.; and Vercellotti, Leonard C., to Westinghouse Electric Corporation. Elevator system. 3,995,719, Cl. 187-29.00R.

Manfred, Ken Max; de la Noceda, Joaquin Garcia; and Ramos, Severino. Low visibility answer sheet and method of testing. 3,995,381, Cl. 35-48.00A.

Manfredi, Pierre, to Societe de Fabrication d'Elements Catalytiques. Method of spray-coating with metal alloys. 3,996,398, Cl. 427-191.000.

Manganaro, James Lawrence: *See—*
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Gray, Charles A.; Berkowitz, Sidney; and Manganaro, James Lawrence, 3,996,225.

Mann, Henry: *See—*
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Manning, Kenzel P.; Cohn, Martin; and Lempel, Abraham, to Sperry Rand Corporation. Data recording and transmission apparatus utilizing non-consecutive zero coding. 3,996,613, Cl. 360-40.000.

Manspeaker, Edward L. Arrowhead with removable blades. 3,995,860, Cl. 273-106.50B.

Markiewitz, Kenneth H., to ICI United States Inc. Polyurethane polymers. 3,996,269, Cl. 260-482.00C.

Marley Cooling Tower Company, The: *See—*
Cates, Robert E., 3,995,689.

Marmonier, Pierre; Mesnage, Bernard; Teulon, Jean; Vayra, Jean; and Venobre, Henri, to Commissariat a l'Energie Atomique. Device for supporting a fuel pin cluster within a nuclear reactor fuel assembly wrapper. 3,996,101, Cl. 176-78.000.

Marosi, Laszlo: *See—*
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Marsan, Mario Stephen: *See—*
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Marsh, Norman L.: *See—*
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Marsh, Ronald W.: *See—*
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Marshall, John R.: *See—*
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Martin, John H.: *See—*
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Marx, Michael; and Kertesz, Denis John, to Syntex (U.S.A.) Inc. 21-Esters of steroidal-21-aldehyde hydrates and 21-aldehyde hemiacetals and methods of preparation. 3,996,358, Cl. 424-241.000.

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Mathis, Tracy L. Reference index system. 3,995,389, Cl. 40-360.000.

Matsuda, Akio, to Agency of Industrial Science & Technology. Catalysts for hydroformylation and hydroesterification and method for manufacture thereof. 3,996,164, Cl. 252-431.00N.

Matsukawa, Hiroharu; Saeki, Keiso; and Watanabe, Akio, to Fuji Photo Film Co., Ltd. Production of microcapsules. 3,996,156, Cl. 252-316.000.

Matsumoto, Kounosuke; Tamura, Tadashi; Morita, Akira; Imayasu, Sigeru; and Nomura, Toshio, to Japan Vilene Company Ltd. Conjugate polycarbonate fibers and fibrous sheets made thereof. 3,996,404, Cl. 428-224.000.

Matsuo, Takashi: *See—*
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May, George, deceased; by May, Gloria Elizabeth, executrix; by Adlam, Heather Miranda, executrix; and White, Desmond Deverell, to Dufaylite Developments Limited. Honeycomb materials. 3,996,087, Cl. 156-197.000.

May, Gloria Elizabeth, executrix: *See—*
May, George, deceased; May, Gloria Elizabeth, executrix; Adlam, Heather Miranda, executrix; and White, Desmond Deverell, 3,996,087.

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McCall, Mary S., to Nuclear Medical Laboratories, Inc. Analytical sorbent and method of use. 3,996,162, Cl. 252-430.000.

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McLean, Robert E., to Rival Manufacturing Company. Push button operated can opener. 3,995,366, Cl. 30-4.00R.

McMillin, John R., to Cornelius Company, The. Beverage dispensing system. 3,995,441, Cl. 62-177.000.

McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., to Eaton Corporation. Skid control system. 3,995,912, Cl. 303-21.0AF.

McSherry, Thomas. Stackable carton with reclosable pour spout construction. 3,995,806, Cl. 229-17.00R.

McWilliams, Donald E.; and Schaefer, William L., to PPG Industries, Inc. Insulated heater tray for making glass fibers and method for using same. 3,996,032, Cl. 65-3.00C.

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Medina, Jose M., Jr., to International Telephone and Telegraph Corporation. Connector member and extraction tool. 3,995,363, Cl. 29-280.000.

Megelas, Michael, to International Bronze Powders Ltd. Production of flaked metallic powders. 3,995,815, Cl. 241-15.000.

Megraw, Robert A., to Dow Chemical Company, The. Preparation of a three layer, fire retardant particleboard. 3,996,325, Cl. 264-113.000.

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Melfi, Samuel T. Supports for guard rails. 3,995,834, Cl. 256-59.000.

Mendel, Arthur, to Riker Laboratories, Inc. Polyfluoroalkoxy-substituted aromatic carboxylic amides and hydrozides. 3,996,280, Cl. 260-559.00R.

Mendelson, Barry. Teeter board device. 3,995,852, Cl. 272-111.000.

Merav, Abraham D. Intratracheal tube. 3,995,643, Cl. 128-351.000.

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Meyerhofer, Dietrich, to RCA Corporation. Controlled angle viewing screens by interference techniques. 3,996,051, Cl. 96-27.00E.

Meyers, Leo J., to Louis A. Grant, Inc. Low profile soaking pit machine. 3,995,344, Cl. 15-104.070.

Meyers, Robert D. Shower shelving unit. 3,995,330, Cl. 4-146.000.

Micallef, Lewis A., to Leeds and Micallef. Direct finger actuated pump. 3,995,776, Cl. 222-207.000.

Michaels, Robert E., to VCA Corporation. Method for filling aerosol spray dispensers. 3,995,666, Cl. 141-3.000.

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Midwest Microwave, Inc.: *See—*
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Mihailovski, Alexander, to Stauffer Chemical Company. Miticidal compounds. 3,996,379, Cl. 424-308.000.

Mikos, Aloysius J., to Chicago Lock Co. Key ejector lock. 3,995,463, Cl. 70-388.000.

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Millar, Robert F.; and Mack, George, to UOP Inc. Dispensing apparatus for particulate matter. 3,995,753, Cl. 214-17.0CB.

Miller, Donald E., to Burroughs Corporation. Buttable flat panel display module. 3,996,490, Cl. 313-217.000.

Miller, Harry R.; and Kumpf, Michael S., to NCR Corporation. Multi-ribbon cassette and ribbon drive. 3,995,731, Cl. 197-168.000.

Millheiser, Melvin, to Waldes Kohinoor, Inc. Self-locking retaining ring assembly tool. 3,995,360, Cl. 29-229.000.

Miils, Justin W., Jr., to Lif-O-Gen, Inc. High pressure gas regulator. 3,995,636, Cl. 137-497.000.
Mmagawa, Yoshisato; and Okumura, Akio, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 3,996,055, Cl. 96-74.000.
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Mitter, Mathias, to Mitter & Co. Method of tensioning and printing a web on an endless blanket. 3,995,548, Cl. 101-426.000.
Mitter, Mathias, to Mitter & Co. Web tensioning and feeding apparatus. 3,995,551, Cl. 101-118.000.
Mitter, Mathias, to Mitter & Co. Screen printing machine with adjustable end mounting units. 3,995,552, Cl. 101-122.000.
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Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Phosphonated N,N-disubstituted fatty morpholines as bacterial and fungicidal agents. 3,996,353, Cl. 424-200.000.
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Mullen, Arthur L., Jr., to United States of America, Navy. Rocket/missile motor explosive insert detonator. 3,995,549, Cl. 102-56.0SC.
Muller, Karl H.; and Sieffert, Andre E., to European Atomic Energy Community (Euratom). Device for the taking of air probes in a sequential manner. 3,995,494, Cl. 73-421.5OR.
Muller, Peter, to Andrews Paper & Chemical Co. Diazotype reproduction layer formed from matrix of spheric particle polystyrene pigment and diazotype components. 3,996,056, Cl. 96-75.000.
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Mylaeus, Armin. Building kit for the production of three-dimensional frameworks. 3,995,962, Cl. 403-47.000.
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Nakamura, Hirokazu; Kinoshita, Mitsutaka; Ito, Tadahiko; and Kawata, Kazumasa, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Four cylinder straight-type engine with secondary bala..cer system. 3,995,610, Cl. 123-192.00B.
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Nakano, Masahiro; Higuchi, Takeru; and Hussain, Anwar, to Alza Corporation. Osmotic dispenser. 3,995,632, Cl. 128-260.000.
Nakao, Hisaji; Tokura, Yasufumi; Yomogida, Toshihiko; and Matsuura, Kazuo, to Toyoda Koki Kabushiki Kaisha; and Toyoda Jidosha Kogyo Kabushiki Kaisha. Programmable sequence controller. 3,996,565, Cl. 340-172.500.
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Nassar, Esam M. Wind machine with reciprocating blade means. 3,995,972, Cl. 416-68.000.
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Nesmeyanov, Alexander Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna. Medicinal preparation for treating parodontosis and method of treating parodontosis. 3,996,377, Cl. 424-295.000.
Nette, Friedrich Wilhelm. Vibratory comminutor. 3,995,781, Cl. 241-147.000.
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Oh, Chan Soo; and Pasierb, Edward Francis, to RCA Corporation. Alkoxybenzylidene-aminobenzonitriles. 3,996,260, Cl. 260-465.00E.
Ohashi, Shigeo. Switch with rocker actuator having detachable cover. 3,996,441, Cl. 200-309.000.
Ohashi, Teruo. Prefabricated reach-in refrigerator-freezer. 3,995,922, Cl. 312-257.00R.
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Patel, Bhupendra C., to Kendall Company, The. Anesthesia device. 3,995,629, Cl. 128-215.000.

Pater, Walter E.: *See—*
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Patil, Pandit G., to PPG Industries, Inc. Solar heat collector unit. 3,995,613, Cl. 126-271.000.

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Patrin, Nicholas Alex, to International Business Machines Corporation. Charge coupled optical scanner with blooming control. 3,996,600, Cl. 357-30.000.

Patterson, Douglas Edward. Model glider and method of flying. 3,995,393, Cl. 46-79.000.

Paust, Joachim: *See—*
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Payton, James H., to Nalco Chemical Company. Water-based microbicide formulation. 3,996,378, Cl. 424-302.000.

Pearce, Fredric C., Jr. Connector device for breathing apparatus. 3,995,626, Cl. 128-142.200.

Pelse, Igor A.: *See—*
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Pelton, George: *See—*
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Penick, Ib; and Volkert, John K., to Compak Systems, Inc. Pop-up products and method of making. 3,995,388, Cl. 40-126.00A.

Penny, Samuel Lee, to Dresser Industries, Inc. Bearing separator and sealing system for rock bit. 3,995,367, Cl. 308-8.200.

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Perchonock, Carl David: *See—*
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Percival, William Spencer: *See—*
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Perkins, Thomas K.; and Ng, Frederick W., to Atlantic Richfield Company. Method for completing a well in a permafrost zone. 3,995,695, Cl. 166-302.000.

Perry, Clifford R., to Boeing Company, The. High solids brine distributor. 3,995,663, Cl. 138-38.000.

Perry, Ronald B.: *See—*
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Personal Communications, Inc.: *See—*
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Peters, Margot Elizabeth: *See—*
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Peters, Melville F., to Peters, Walter Todd; Peters, Margot Elizabeth; and Kronman, Albert F. Apparatus for generating power using environmental temperature differentials. 3,995,429, Cl. 60-641.000.

Peters, Walter Todd: *See—*
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Petersen, Harro; and Erhardt, Klaus, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 4-oxotetrahydro-1,3,5-oxadiazines. 3,996,220, Cl. 260-244.00R.

Petersen, Harro: *See—*
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Peterson, Thomas R., to Structural Concepts Corporation. Panel molding. 3,995,405, Cl. 52-627.000.

Petritsch, Josef Peter, to Intercont Development Corporation Pty. Ltd.; and Plant-Fab Construction & Installations Pty. Ltd. Electropyrolytic upright shaft type solid refuse disposal and conversion process. 3,996,044, Cl. 75-10.00R.

Petro-Tex Chemical Corporation: *See—*
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Petrolite Corporation: *See—*
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Pfahl, Kurt A.; Robinson, Richard A.; and Brougher, Craig Ritchie, to Hallmark Cards, Incorporated. Automatic densitometer and method of color control in multi-color printing. 3,995,958, Cl. 356-173.000.

Pfefferkorn, Bernd: *See—*
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Pfefferkorn, Hans O.; Pfefferkorn, Bernd; and Reiter, Viktor H. Bottle stopper means for wine bottles. 3,995,762, Cl. 215-256.000.

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Picardat, Robert N. Two part lawn treating machine. 3,995,569, Cl. 111-12.000.
Pienkowski, Stanley A., to Molex Incorporated. Terminal for apertured circuit panel. 3,995,931, Cl. 339-217.00S.
Piguet, Pierre, to Ateliers des Charmilles S.A. Valve operable solely under still water conditions, chiefly in forced flow channels. 3,995,827, Cl. 251-58.000.
Pilkington Brothers Limited: *See—*
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Pilloff, Herschel S., to United States of America, Navy. Internally referenced, laser intracavity technique for measuring small gains or losses. 3,995,957, Cl. 356-114.000.
Pirl, Karl: *See—*
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Plager, Malcolm, to Burroughs Corporation. Data handling system having a plurality of interrelated character generators. 3,996,584, Cl. 340-324.0AD.
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Plesniarski, Edward J., to General Motors Corporation. Restraint belt system with comfort clamp assembly. 3,995,885, Cl. 280-747.000.
Plyler, Robert G.: *See—*
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Poe, Norman. Power transmission belt. 3,995,506, Cl. 74-231.0MB.
Pogonowski, Ivo C., to Texaco Inc. Method for increasing the load carrying capacity and pull-out resistance of hollow piles. 3,995,438, Cl. 61-53.680.
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Poot, Albert Lucien: *See—*
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Porter, Erland C., Jr., to NCR Corporation. Pressure-sensitive record material. 3,996,405, Cl. 428-307.000.
Porter, Robert E. Work feeder for sewing machine. 3,995,571, Cl. 112-207.000.
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Pries, Erich, to Dr. C. Otto & Comp. G.m.b.H. Coke oven battery having twin heating flues. 3,996,109, Cl. 202-141.000.
Prince, Jack E.; Terry, Franklin E.; and Mullins, William H. Liquid waste treatment apparatus. 3,996,139, Cl. 210-198.00R.
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Bobeck, Andrew Henry; McGahey, Bruce Hamilton; Melbert, William Martin, Jr.; Prince, Terry Brice; and Stevenson, Martin James, 3,996,574.
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Provorse, Clifford. Easy to install telephone service bracket. 3,996,415, Cl. 174-48.000.
Pruznick, Michael D.; Ketcham, David J.; Lowe, Roger W.; and Opittek, Eugene W., to Hughes Aircraft Company. Television display utilizing local area brightness control. 3,996,421, Cl. 178-7.30D.
Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, to Ciba-Geigy AG. Process for the dope dyeing of linear polyesters. 3,996,191, Cl. 260-40.00P.
Pullman Incorporated: *See—*
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Vornberger, George F.; and Glassmeyer, John J., 3,995,871.
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Queeney, Paul J., to Westinghouse Electric Corporation. Digital line-of-sight deflection control device. 3,995,944, Cl. 350-285.000.
Quinlan, John R., to Smith International, Inc. Aluminum bronze bearing. 3,995,917, Cl. 308-8.200.
Rabatin, Jacob G., to General Electric Company. Thermoluminescent materials utilizing rare earth oxyhalides activated with terbium. 3,996,472, Cl. 250-484.000.
Radice, Constance: *See—*
Montalbano, Anthony P., 3,995,543.
Rahmstorf, Dietmar, to Messrs. BiG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag. Easily assemblable toy figure. 3,995,395, Cl. 46-161.000.
Rakestraw, Lawrence F.; Bullard, Richard W.; Niesse, John E.; and Bender, Malcolm F., to Monsanto Company. Method for improving hydrolytic stability of the bond between steel surfaces and organic adhesives. 3,996,074, Cl. 148-6.160.
Ramos, Severino: *See—*
Manfred, Ken Max; de la Noceda, Joaquin Garcia; and Ramos, Severino, 3,995,381.
Randolph, Arthur J. Quilting machine. 3,995,359, Cl. 29-211.00R.
Raphael, Rouchdy B. Apparatus for cutting arcs of circles with band saws and the like. 3,995,521, Cl. 83-411.00R.
Rapuano, Joseph A. Method and apparatus for securing a retention pin to a tooth. 3,995,372, Cl. 32-40.00R.
Raschack, Manfred: *See—*
Cyrus, Richard; and Raschack, Manfred, 3,996,360.
Rasmussen, Oystein E. Means for removal of adsorbed film and microorganisms from teeth and oral cavities. 3,996,126, Cl. 204-271.000.
Rastetter, Adolf. Safety arrester for arresting a hydraulically operated lifting ram of a hydraulic elevator. 3,995,534, Cl. 92-27.000.
Ratz, Heinz: *See—*
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Rausch, Richard E., to Universal Oil Products Company. Hydroprocessing of hydrocarbons. 3,996,304, Cl. 260-667.000.
Rautimo, Pentti J.; and Kapanen, Aarne A., to Outokumpu Oy. Device for detaching an electrolytically precipitated metal sheet from a cathode. 3,996,127, Cl. 204-281.000.
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Bankaw, William Henry, 3,996,542.
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Scheffer, Harvey Dow Gibson, 3,995,845.
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Reach, Roy W.; Kahn, William M.; and Shapiro, David, to Hewlett-Packard Company. Programmable electronic calculator for evaluating mathematical problems. 3,996,562, Cl. 340-172.500.

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Republic Steel Corporation: *See—*
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Resonance Motors, Inc.: *See—*
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Results Engineering, Inc.: *See—*
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Rethwish, William F., to Rohr Industries, Inc. Tool length compensator for numerically controlled machine. 3,995,528, Cl. 90-11.00E.

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Ricoh Co., Ltd.: *See—*
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Riken Keikinzoku Kogyo Kabushiki Kaisha: *See—*
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Rival Manufacturing Company: *See—*
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Roberts, Donald L., to NCR Corporation. Optical mass memory. 3,996,570, Cl. 340-173.0LM.

Roberts, Earl J.: *See—*
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Roberts, Edward S. Waste heat recovery system. 3,995,428, Cl. 60-641.000.

Robertson, William E.: *See—*
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Roderburg, Harald: *See—*
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Romeo, Albert J.; and Sherbert, Edward G., to Decision Data Computer Corporation. Card advancement mechanism. 3,995,545, Cl. 101-19.000.

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Ronne, R. Mack. Trailer dolly. 3,995,876, Cl. 280-423.00A.

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Rose, Wayne A. Combination hay handler and feeder. 3,995,594, Cl. 119-60.000.

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Rosman, Irwin E. Rivet fastener system. 3,995,406, Cl. 52-758.00D.

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Rowland-Hill, Edward W., to Sperry Rand Corporation. Axial flow combine having concave relief. 3,995,645, Cl. 130-27.00T.

Rowland, Stanley P.; Cirino, Vidabelle O.; and Roberts, Earl J., to United States of America, Agriculture. Method of polymerizing and fixing carboxyl-containing vinyl monomers in high conversion on fibrous substrates. 3,995,998, Cl. 8-115.600.

Rowland, Stanley P.: *See—*
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Rowley, James R.; and Pater, Walter E., to PPG Industries, Inc. Shipping bin for sheets with device for restraining movement of the sheets. 3,995,738, Cl. 206-451.000.

Rozett, Lawrence, to Singer Company, The. Knitting machine performance regulating system. 3,995,450, Cl. 66-8.000.

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Santemma, Hector J.; and Fisch, Richard S., to Minnesota Mining and Manufacturing Company. Color photographic developing solution. 3,996,054, Cl. 96-66.00R.

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Saunders, Robert John Dowrick, to British Food Manufacturing Industries Research Associated, The. Information storage systems and input stages therefor. 3,996,569, Cl. 340-173.00R.

Saunders, William T., to National Steel Corporation. Forming small diameter opening for aerosol, screw cap, or crown cap by multistage necking-in of drawn or drawn and ironed container body. 3,995,572, Cl. 113-120.00H.

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Schade, Otto Heinrich, Jr., to RCA Corporation. Current limiting circuit and method. 3,996,498, Cl. 317-33.0VR.

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Schaefer, David H.; and Strong, James P., to United States of America, National Aeronautics and Space Administration. Two-dimensional radiant energy array computers and computing devices. 3,996,455, Cl. 235-152.000.

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Schiff, Joseph. Office machine including retractable feeder. 3,995,847, Cl. 270-58.000.

Schinzel, Erich; Frischkorn, Hans; and Rosch, Gunter, to Hoechst Aktiengesellschaft. 1,2,4-Triazolyl-(1) derivatives, a process for their preparation and their use as optical brighteners. 3,996,213, Cl. 260-240.00C.

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Schlager, Ludwig H., to Gerot-Pharmazeutika Dr. Walter Otto K.G. Novel 2-aminomethyl-4-,6-dihalogenphenol derivatives and methods for the preparation thereof. 3,996,278, Cl. 260-559.00R.
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Schmid, Markus, to Concast AG. Apparatus for the direct cooling of a strand. 3,995,684, Cl. 164-283.00S.
Schmidt, Charles E., to GTE Automatic Electric Laboratories Incorporated. Single amplifier network for simulating an FDNR circuit. 3,996,538, Cl. 333-80.00R.
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Schmitz, Johannes J., to Westinghouse Electric Corporation. Comparator/bistable circuit. 3,996,479, Cl. 307-235.00F.
Schnell, William J.; and Wolf, Ludwig, Jr., to Baxter Laboratories, Inc. Swirling flow bubble trap. 3,996,027, Cl. 55-36.000.
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Schomer, Paul D., to United States of America, Army. Logarithmic statistical distribution analyzer. 3,995,500, Cl. 73-552.000.
Schoppe, Wayne F., to Xerox Corporation. Sheet feeding apparatus. 3,995,952, Cl. 355-3.00R.
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Schreiber, Bruno; and Diethelm, Hermann, to Ciba-Geigy Corporation. Storage-stable epoxide moulding compositions. 3,996,186, Cl. 260-37.0EP.
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Sekhar, Neel C., to Upjohn Company, The. Process for inhibiting platelet aggregation. 3,996,103, Cl. 195-1.800.
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Shaber, Gary S. Method and apparatus for determining the operational status of a photographic film processor. 3,995,959, Cl. 356-202.000.
Shaffner, Richard O.; and Smyser, William E., to General Electric Company. High pressure metal halide lamp with electron collector. 3,995,928, Cl. 315-60.000.
Shallenberger, Dennis J.; and Hill, Charles E., to Kennametal Inc. Pulverizing device. 3,995,782, Cl. 241-188.00R.
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Sleezer, Paul D.; and Johnson, David A., to Bristol-Myers Company. Methoxymethyl D-6-(2,2-dimethyl-5-oxo-4-phenyl-1-imidazolidinyl)penicillanate. 3,996,236, Cl. 260-306.70C.

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Slovinsky, Manuel; Phillips, Kenneth G.; and Fong, Dodd Wing, to Nalco Chemical Company. Process for making bis trichloromethyl sulfone emulsions. 3,996,155, Cl. 252-312.000.

Smader, C. Louis, to Scovill Manufacturing Company. Doughmaker attachment for kitchen mixer. 3,995,840, Cl. 259-107.000.

Smejda, Richard K. Patterning and blending with lateral distribution channels and crosswise feeder systems. 3,995,581, Cl. 118-7.000.

Smith International, Inc.: *See—*
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Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corporation. Malonic acid derivative composition for forming thermoparticulating coating. 3,995,489, Cl. 73-339.00R.

Smith, James E.: *See—*
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Smith, John Marvin, to Motorola, Inc. RF power semiconductor package and method of manufacture. 3,996,603, Cl. 357-80.000.

Smith, John T.: *See—*
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Smith, Meredith E., to International Business Machines Corporation. Method and apparatus for obtaining desired batch weight in a solid slicing control system. 3,995,517, Cl. 83-13.000.

Smith, Nora S.: *See—*
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Smith, Norman Douglas Patrick: *See—*
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Smith, Peter D. Solar tracking control system using shadow detection. 3,996,460, Cl. 250-203.00R.

Smith, Richard E., to National Gypsum Company. Method of attaching wallboard and stud therefor. 3,995,401, Cl. 52-127.000.

Smith, Robert M., to Duriron Company, Inc., The. Polytetrafluoroethylene lip seal. 3,995,868, Cl. 277-184.000.

Smith, Roy A., to Red Wing Shoe Compnay, Inc. Instep guard for safety shoes. 3 995,382, Cl. 36-72.00R.

Smith, Spurgeon E.: *See—*
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Smith, Teddy Van, to Smith, Nora S. Extruded panel product apparatus. 3,995,980, Cl. 425-131.100.

Smith, Willard Allen: *See—*
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Sneed, Robert C.; and Young, Joseph C., to Faa-Line Sales & Rentals, Inc. Laying of flexible pipe. 3,995,355, Cl. 29-157.00R.

Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company. Method of producing a tubular foamed plastic article. 3,996,322, Cl. 264-45.700.

Societa' Farmaceutici Italia S.p.A.: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe Francaise des Silicates Speciauz "SIFRANCE": *See—*
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Societe Lorraine de Laminage Continu(Sollack) S.A.: *See—*
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Sofianek, Joseph C.: *See—*
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Rooke, Philip M.; Scott, Harry B.; Angevine, Peter A.; and Bunk, Stanley A., 3,996,333.
Spang, Charles M. Method and apparatus for tool support and adjustment in turret-type automatic screw machines. 3,995,514, Cl. 82-36.00R.
Spanski, Paul L.; and Beck, Ronald R., to United States of America, Army. Force feedback controlled winch. 3,995,831, Cl. 254-173.00R.
Spargo, Ronald F., to Massey-Ferguson Services N.V. Sugar cane dividing means. 3,995,520, Cl. 83-345.000.
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Spawn, Donald Henry: *See—*
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Sprinter Pack AB: *See—*
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Staats, Henry N., to General Binding Corporation. Heat reactivatible adhesive book binding. 3,995,886, Cl. 281-21.00R.
Stabenow, Joachim; Marosi, Laszlo; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Crystalline beryllo-alumino-silicates and process for their manufacture. 3,996,337, Cl. 423-328.000.
Stabilus GmbH: *See—*
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Stack, Marian C., heir: *See—*
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Staffier, Dominic Thomas; Shershow, Samuel Louis; and Norton, William Barry. Composition for reducing bodily odor and perspiration. 3,996,346, Cl. 424-67.000.
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Stanford, James R.; Martin, John H.; and Chappell, George D., to Nalco Chemical Company. Catalyst for sulfite scavengers. 3,996,135, Cl. 210-62.000.
Stanko, John J. Foundry flask clamp. 3,995,685, Cl. 164-386.000.
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Steineke, Fredrik, to Elkem-Spigerverket. Method of producing aluminum fluoride. 3,996,340, Cl. 423-489.000.
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Stephens, James B., to Graning Company. Drain stopper. 3,995,333, Cl. 4-286.000.
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, to Allied Chemical Corporation. Vehicle sensitive retractor with improved universal pendulum and gimbal. 3,995,788, Cl. 242-107.40A.
Sterling Drug Inc.: *See—*
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Stewart, Frank E. Removable redeemable coupon for newspaper advertisements and method and apparatus for producing same. 3,995,555, Cl. 101-426.000.
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Straitz, John F., III. Flare gas burner. 3,995,986, Cl. 431-114.000.
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Camisa, Raymond Louis; Hitch, Benjamin Franklin; and Yuan, Shui, 3,996,536.
Yukata, Toshihide; Yamakami, Nobuyuki; Honma, Masao; Komachiya, Yoshioki; and Wakamatsu, Hachiro, to Ajinomoto Co., Inc. Method of producing aldehydes by hydroformylation. 3,996,288, Cl. 260-599.000.
Yusa, Takashi: *See—*
Sakai, Kiyoshi; Yusa, Takashi; Ide, Junya; Yamazaki, Mitsuo; and Kobayashi, Shinsaku, 3,996,263.
Zafuto, Samuel L. Protective jacket. 3,995,320, Cl. 2-2.000.

Zagami, Johnnie. Self-contained garbage can cover. 3,995,764, Cl. 220-263.000.
Zavaras, Alexander A.; and Ryan, Robert E., to Republic Steel Corporation. Induction stirring in continuous casting. 3,995,678, Cl. 164-49.000.
Zeidenberg, Robert: *See*—
Hajagos, Michael Stephen, deceased; Zeidenberg, Robert; Davis, Edward Frank; Halasz, Joseph; and Dormany, Robert, 3,995,583.
Zenith Radio Corporation: *See*—
Bratschun, William R., 3,996,502.
Zhadanovsky, Naum Borisovich: *See*—
Nametkin, Nikolai Sergeevich; Gubin, Sergei Pavlovich; Tjurin, Vladimir Dmitrievich; Fedorov, Viktor Viktorovich; Larionov, Leonid Ivanovich; Kozin, Vladimir Alexandrovich; Zhadanovsky, Naum Borisovich; and Barashkov, Ruslan Yakovlevich, 3,996,130.
Zibrun, Joseph. Steam engine. 3,995,531, Cl. 91-152.000.
Zingg, Warren M., to Dow Chemical Company, The. Apparatus and method for wetting dry particles and dispersing the particles in a liquid. 3,995,839, Cl. 259-22.000.
Zoecon Corporation: *See*—
Henrick, Clive A., 3,996,380.
Zucchinelli, Mario, to Saes Getters S.p.A. Getter device with deflector. 3,996,488, Cl. 313-174.000.
Zucker, Friedrich J., to Supraton Auer & Zucker OHG. Arrangement for the production of a suspension of highly swellable substances. 3,995,838, Cl. 259-10.000.
Zucker, Friedrich J., to Hans Heinrich Auer. Catalytic reactor having disk-shaped, rotor-stator, reaction surfaces. 3,996,012, Cl. 23-288.00E.
Zwagemakers, Johannes Maria Antonius: *See*—
Hartog, Jan; and Zwagemakers, Johannes Maria Antonius, 3,996,245.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,048	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 7TH DAY OF DECEMBER, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Anantha, Narasipur G.; and Dockerty, Robert C., to International Business Machines Corporation. Schottky barrier diode having chargeable floating gate. T953,005, 12-7-76, Cl. 357-15.000.

Atlantic Richfield Company: *See*—
Yoo, Jin Sun, T953,008.

Dockerty, Robert C.: *See*—
Anantha, Narasipur G.; and Dockerty, Robert C., T953,005.

Dow Chemical Company, The: *See*—
Raley, Charles F.; and Rudd, John F., T953,006.

Du Pont de Nemours, E. I., and Company: *See*—
Fritz, Andrea, T953,003.

Firester, Arthur Herbert, to RCA Corporation. Optical videodisc playback system with plural photodetectors. T953,002, 12-7-76, Cl. 178-66.00R.

Firestone Tire & Rubber Company, The: *See*—
Smith, Robert C., T953,011.

FMC Corporation: *See*—
Koldenhoven, Edwin Frank, T953,010.

Fritz, Andrea, to Du Pont de Nemours, E. I., and Company. Thermoplastic paintable polyolefin composition. T953,003, 12-7-76, Cl. 260-42.460.

General Electric Company: *See*—
Tachick, Henry N.; and Small, Leonard M., T953,007.

Hendy, Brian Norman. Naturally degradable acrylonitrile and methacrylonitrile polymers. T953,001, 12-7-76, Cl. 260-63.00N.

International Business Machines Corporation: *See*—
Anantha, Narasipur G.; and Dockerty, Robert C., T953,005.

Koldenhoven, Edwin Frank, to FMC Corporation. Herbicidal combinations and method of controlling weeds in crops. T953,010, 12-7-76, Cl. 71-93.000.

Neuhaus, Heinz. Warp knit product and the process of making same. T953,009, 12-7-76, Cl. 66-195.000.

Parsons, Theron E., III. Thermosetting powder coating and process. T953,004, 12-7-76, Cl. 260-15.000.

Radovsky, Jonathan Samuel, to RCA Corporation. Current amplifier. T953,012, 12-7-76, Cl. 330-40.000.

Raley, Charles F.; and Rudd, John F., to Dow Chemical Company, The. Antistatic cellular polyolefin resin products. T953,006, 12-7-76, Cl. 260-2.50R.

RCA Corporation: *See*—
Firester, Arthur Herbert, T953,002.
Radovsky, Jonathan Samuel, T953,012.

Rudd, John F.: *See*—
Raley, Charles F.; and Rudd, John F., T953,006.

Small, Leonard M.: *See*—
Tachick, Henry N.; and Small, Leonard M., T953,007.

Smith, Robert C., to Firestone Tire & Rubber Company, The. Transparent impact polystyrene plastics of multiple block copolymers. T953,011, 12-7-76, Cl. 260-880.00B.

Tachick, Henry N.; and Small, Leonard M., to General Electric Company. Shielded electric power cable separable connector module having a mating surface coated with a resin-bonded solid film lubricant. T953,007, 12-7-76, Cl. 339-111.000.

Yoo, Jin Sun, to Atlantic Richfield Company. Hydrocarbonylation over iron on support having silica alumina dispersed in a separate phase alumina matrix. T953,008, 12-7-76, Cl. 260-632.0HF.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF DECEMBER, 1976

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Watson, Hugh Alexander, Re. 29,067.

Bendix Corporation, The: *See*—
Reddy, Junuthula N., Re. 29,060.

Bucalo, Louis, to Microbyx Corporation. Internal blood collection. Re. 29,061, Cl. 128-2.00F.

Daido Metal Company, Ltd.: *See*—
Morisaki, Nobukazu, Re. 29,064.

Evans, Roger L., to Minnesota Mining and Manufacturing Company. Biodegradable radioactive particles. Re. 29,066, Cl. 424-1.000.

Graser, Earl J., to Olinkraft, Inc. Returnable wrap-around carrier. Re. 29,063, Cl. 206-141.000.

Holubar Mountaineering, Ltd.: *See*—
Kack, James W.; and Mowbray, Terry W., Re. 29,059.

IMS Limited: *See*—
Ogle, Robert W., Re. 29,062.

Kack, James W.; and Mowbray, Terry W., to Holubar Mountaineering, Ltd. Method of manufacture of down insulated goods. Re. 29,059, Cl. 28-77.000.

Microbyx Corporation: *See*—
Bucalo, Louis, Re. 29,061.

Minnesota Mining and Manufacturing Company: *See*—
Evans, Roger L., Re. 29,066.

Morisaki, Nobukazu, to Daido Metal Company, Ltd. Sliding bearing system. Re. 29,064, Cl. 252-12.600.

Mowbray, Terry W.: *See*—
Kack, James W.; and Mowbray, Terry W., Re. 29,059.

Ogle, Robert W., to IMS Limited. Intravenous container mixing assembly. Re. 29,062, Cl. 128-214.00C.

Olinkraft, Inc.: *See*—
Graser, Earl J., Re. 29,063.

Owens-Illinois, Inc.: *See*—
Uhlig, Albert R., Re. 29,065.

Reddy, Junuthula N., to Bendix Corporation, The. Circuit for providing electronic warm-up enrichment fuel compensation which is independent of intake manifold pressure in an electronic fuel control system. Re. 29,060, Cl. 123-32.0EA.

Schopfer, Walter S.; and Wuerth, Dieter, to WLW Corporation. Appliance removal alarm system for motels. Re. 29,068, Cl. 340-280.000.

Uhlig, Albert R., to Owens-Illinois, Inc. Method for blow molding. Re. 29,065, Cl. 264-89.000.

Watson, Hugh Alexander, to Bell Telephone Laboratories, Incorporated. Compact flatbed page scanner. Re. 29,067, Cl. 178-7.100.

WLW Corporation: *See*—
Schopfer, Walter S.; and Wuerth, Dieter, Re. 29,068.

Wuerth, Dieter: *See*—
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Arakawa, Shinichiro, to Ebara Manufacturing Co., Ltd. Submersible pump. 242,651, 12-7-76, Cl. D15-7.000.

Asai, Yoshinobu, to Sansui Electric Co., Ltd. Amplifier. 242,636, 12-7-76, Cl. D26-14.00L.

Asai, Yoshinobu, to Sansui Electric Co., Ltd. Amplifier. 242,637, 12-7-76, Cl. D26-14.00L.

Asai, Yoshinobu, to Sansui Electric Co., Ltd. Amplifier. 242,638, 12-7-76, Cl. D26-14.00L.

Astle, Miles Henry, to John Dale Limited. Shipping container. 242,660, 12-7-76, Cl. D87-1.00R.

Astra-Sjuco AB: *See*—
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CBS Inc.: *See—*
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Cole, Ronald E.; and Schonegg, Louis E., to Regency Electronics, Inc. Radio channel programming comb. 242,629, 12-7-76, Cl. D26-1.00R.
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Covey, Laird Fortune, to Stanley Works, The. Combined tape measure and key-chain. 242,607, 12-7-76, Cl. D10-72.000.
Curran, Frank J., to Frank J. Curran Company. Holder for air freshener or the like. 242,621, 12-7-76, Cl. D23-150.000.
Darrell, Jack. Sign for glass door or the like. 242,662, 12-7-76, Cl. D96-12.00R.
De Lise, Frank C.; and De Lise, Stephen W. Rubbish and garbage receptacle. 242,595, 12-7-76, Cl. D7-194.000.
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Kaufman, Jack W., to Bio-Med Plastics, Inc. Combined brush and sponge. 242,585, 12-7-76, Cl. D4-17.000.
Kaufman, Jack W., to Bio Med Plastics, Inc. Combined brush and sponge. 242,586, 12-7-76, Cl. D4-17.000.
Kelson, Arthur W., to Propper Manufacturing Co., Inc. Sterilization indicator card. 242,656, 12-7-76, Cl. D83-1.00W.
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Cade, J. Robert; and Raulerson, James D., 242,655.
Rawls, Norma Jean Chiera. Intravenous infusion assist tray. 242,654, 12-7-76, Cl. D83-1.00U.
Regency Electronics, Inc.: *See—*
Cole, Ronald E.; and Schonegg, Louis E., 242,629.

Rineman, Harold J.: *See—*
Rineman, Richard Lynn, 242,614.
Rineman, R. Lynn: *See—*
Rineman, Richard Lynn, 242,614.
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Roche, David: *See—*
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Bake, Earl A.; and Schoeneweis, E. Frederick, 242,619.
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Saltzman, George. Diamond cut in starform. 242,643, 12-7-76, Cl. D11-90.000.
Sanken Steel Co., Ltd.: *See—*
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Asai, Yoshinobu, 242,636.
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Schoeneweis, E. Frederick: *See—*
Bake, Earl A.; and Schoeneweis, E. Frederick, 242,619.
Schonegg, Louis E.: *See—*
Cole, Ronald E.; and Schonegg, Louis E., 242,629.
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Schutte, Harry D., 242,649.
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Scrivener, Ian, to Comalco Products Pty. Limited. Wall stud. 242,627, 12-7-76, Cl. D25-77.000.
Scrivener, Ian, to Comalco Products Pty. Limited. Wall stud. 242,628, 12-7-76, Cl. D25-77.000.
Shakespeare Company: *See—*
Henning, Andrew R., 242,615.
Henning, Andrew R., 242,642.
Sheesley, Wilmer Lee; and Hooper, Dean Roosevelt, to AMP Incorporated. Modular connector housing. 242,630, 12-7-76, Cl. D26-1.00A.
Shorin, Arthur T.; and Hart, Stan, to Topps Chewing Gum, Incorporated. Ring having a matrix for candy. 242,645, 12-7-76, Cl. D45-10.00C.
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Singer Company, The: *See—*
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Sklaroff, William. Desk. 242,587, 12-7-76, Cl. D6-25.000.
Sklaroff, William. Desk. 242,590, 12-7-76, Cl. D6-159.000.
Societe Balneo S.A.R.L.: *See—*
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Spruck, George T. Jewelry finding. 242,644, 12-7-76, Cl. D11-44.000.
Stanley Works, The: *See—*
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Topps Chewing Gum, Incorporated: *See—*
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Shorin, Arthur T.; and Hart, Stan, 242,646.
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Universal Valve Company: *See—*
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Voetsch, Harold E., to Gillan and Voetsch. Mailbox indicator. 242,610, 12-7-76, Cl. D10-109.000.
Wilson, Robert M.: *See—*
Palecki, Thomas L.; and Wilson, Robert M., 242,633.
Xerox Corporation: *See—*
Palecki, Thomas L.; and Wilson, Robert M., 242,633.
Young, S. Albert: *See—*
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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 7, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	3,995,320
49 R	3,995,321
239	3,995,322

CLASS 3

1.2	3,995,324
1.913	3,995,323

CLASS 4

1	3,995,325
7	3,995,326
10	3,995 327
	3,995,328
110	3,995,329
146	3,995,330
185 B	3,995,331
187 R	3,995,332
286	3,995,333

CLASS 5

202	3,995,334
263	3,995,336
327 B	3,995,335
345 B	3,995,337

CLASS 6

4 R	3,995,338

CLASS 8

2.5 R	3,995,992
21 B	3,995,993
26	3,995,994
41 B	3,995,995
74	3,995,996
84	3,995,997
115.6	3,995,998
116 P	3,995,999
179	3,996,000

CLASS 9

2 A	3,995,339

CLASS 12

8.1	3,995,340
10.1	3,995,341

CLASS 13

20	3,996,412

CLASS 14

71.3	3,995,342

CLASS 15

4	3,995,343
104.07	3,995,344
105	3,995,345
182	3,995,346
250.42	3,995,347
328	3,995,348

CLASS 16

125	3,995,349

CLASS 17

23	3,995,350

CLASS 19

102	3,995,351

CLASS 23

230 PC	3,996,002
	3,996,003
	3,996,004
230 R	3,996,001
232 R	3,996,005
253	3,996,006
253 TP	3,996,007
254 E	3,996,010
254 R	3,996,008
	3,996,009
273 R	3,996,011
288 B	3,996,013
288 E	3,996,012
288 F	3,996,016
288 R	3,996,014
	3,996,015
292	3,996,017
295 R	3,996,018

CLASS 28

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CLASS 29

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121.6	3,995,353
130	3,995,354
149.5 R	3,995,357
157 R	3,995,355
	3,995,356
191.4	3,996,019
191.6	3,996,020
194	3,996,021
203 MW	3,995,358
211 R	3,995,359
229	3,995,360
251	3,995,361
257	3,995,362
280	3,995,363
598	3,995,364
630 C	3,995,365

CLASS 30

4 R	3,995,366
34.1	3,995,368
228	3,995,369
382	3,995,370

CLASS 32

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40 R	3,995,372

CLASS 33

143 M	3,995,373
178 R	3,995,374

CLASS 34

155	3,995,375

CLASS 35

15	3,995,379
25	3,995,376
29 F	3,995,377
31 B	3,995,378
34	3,995,380
48 A	3,995,381

CLASS 36

72 R	3,995,382

CLASS 37

126 AE	3,995,383
141 R	3,995,384

CLASS 40

10 R	3,995,385
28 C	3,995,386
64 R	3,995,387
126 A	3,995,388
360	3,995,389

CLASS 42

59	3,995,390

CLASS 43

37	3,995,391

CLASS 44

1 D	3,996,022
62	3,996,023
71	3,996,024

CLASS 46

78	3,995,392
79	3,995,393
119	3,995,394
161	3,995,395

CLASS 47

69	3,995,396
81	3,995,397

CLASS 48

107	3,996,025
197 R	3,996,026

CLASS 49

168	3,995,398

CLASS 51

148	3,995,399
338	3,995,400

CLASS 52

127	3,995,401
241	3,995,402
284	3,995,403
514	3,995,404
627	3,995,405
758 D	3,995,406

CLASS 53

112 A	3,995,407
126	3,995,408
137	3,995,409
159	3,995,410

CLASS 55

36	3,996,027
58	3,996,028
71	3,996,029

CLASS 56

15.8	3,995,411
98	3,995,412
119	3,995,413
202	3,995,414
364	3,995,415
370	3,995,416

CLASS 57

34 R	3,995,417
80	3,995,418
125	3,995,419
140 R	3,995,420

CLASS 60

39.46 R	3,995,421
39.66	3,995,422
288	3,995,423
349	3,995,424
445	3,995,425
486	3,995,426
595	3,995,427
641	3,995,428
	3,995,429
657	3,995,430
684	3,995,431
697	3,995,432
721	3,995,433

CLASS 61

4	3,995,434
12	3,995,435
13	3,995,436
53.68	3,995,438
72.4	3,995,439
86	3,995,437

CLASS 62

30	3,996,030
54	3,995,440
177	3,995,441
259	3,995,442
305	3,995,443
306	3,995,444
325	3,995,446
371	3,995,445

CLASS 63

1 R	3,995,447

CLASS 64

11 R	3,995,448
20	3,995,449

CLASS 65

3 C	3,996,032
	3,996,033
60 C	3,996,034
	3,996,035
273	3,996,036
334	3,996,037

CLASS 66

8	3,995,450
50 R	3,995,451
64	3,995,452
75 A	3,995,453
135	3,995,454
	3,995,455
140 R	3,995,456

CLASS 68

13 R	3,995,457
140	3,995,458

CLASS 70

13	3,995,459
210	3,995,460
225	3,995,461
247	3,995,462
388	3,995,463
434	3,995,464

CLASS 71

5	3,996,038
87	3,996,039
	3,996,040
	3,996,041
90	3,996,042
93	3,996,043

CLASS 72

42	3,995,465
83	3,995,474
106	3,995,466
205	3,995,467
214	3,995,468
328	3,995,469
405	3,995,470

CLASS 73

1 R	3,995,471
40	3,995,472
49.2	3,995,473
104	3,995,483
126	3,995,475
133 R	3,995,476
139	3,995,477
150 R	3,995,478
151	3,995,479
188	3,995,480
189	3,995,481
190 R	3,995,485
194 B	3,995,482
194 EM	3,995,484
200	3,995,486
304 C	3,995,488
339 R	3,995,489
340	3,995,490
379	3,995,491
	3,995,492
393	3,995,493
421.5 R	3,995,494
422 R	3,995,495
425.6	3,995,496
432 R	3,995,497
480	3,995,498
519	3,995,499
552	3,995,500
560	3,995,501

CLASS 74

18.2	3,995,502
143	3,995,504
230	3,995,487
230.17 A	3,995,505
231 MB	3,995,506
233	3,995,507
244	3,995,508
413	3,995,509
478.5	3,995,510
498	3,995,511
501 R	3,995,512
574	3,995,513
750 B	3,995,503

CLASS 75

10 R	3,996,044
11	3,996,045
99	3,996,046
200	3,996,047
208 R	3,996,048

CLASS 82

2.7	3,995,524
36 R	3,995,514

CLASS 83

4	3,995,515
5	3,995,516
13	3,995,517
54	3,995,518
310	3,995,519
345	3,995,520
411 R	3,995,521
467 R	3,995,522

CLASS 84

317	3,995,523

CLASS 86

22	3,995,525

CLASS 89

33 SF	3,995,527

CLASS 90

11 E	3,995,528

CLASS 91

28	3,995,529
40	3,995,530
152	3,995,531
411 R	3,995,532
433	3,995,533

CLASS 92

27	3,995,534
60	3,995,535
120	3,995,536
129	3,995,537
190	3,995,538

CLASS 93

51 HW	3,995,539
93 DP	3,995,540

CLASS 96

1.5	3,996,049
3	3,996,050
22	3,995,526
27 E	3,996,051
35.1	3,996,052
48 R	3,996,053
66 R	3,996,054
74	3,996,055
75	3,996,056
484 D	3,996,057

CLASS 98

6	3,995,541

CLASS 99

569	3,995,542

CLASS 100

53	3,995,543
116	3,995,544

CLASS 101

19	3,995,545
91	3,995,546
93.31	3,995,547
118	3,995,551
122	3,995,552
228	3,995,553
401.1	3,995,554
426	3,995,548
	3,995,555

CLASS 102

56 SC	3,995,549
66	3,995,550
73 R	3,995,556
79	3,995,557
92.4	3,995,558
100	3,995,559

CLASS 104

1 R	3,995,560
172 S	3,995,561

CLASS 105

378	3,995,563
418	3,995,564
465	3,995,562
497	3,995,565

CLASS 106

14	3,996,058
308 N	3,996,059

CLASS 109

21.5	3,995,566

CLASS 110

7 R	3,995,567
8 R	3,995,568

CLASS 111

12	3,995,569
85	3,995,570

CLASS 112

207	3,995,571
258	3,995,573

CLASS 113

120 H	3,995,572

CLASS 114

20 R	3,995,574
66.5 H	3,995,575
144 R	3,995,576
206 R	3,995,577

CLASS 115

6.1	3,995,578
18 E	3,995,579

CLASS 116

173	3,995,580

CLASS 118

7	3,995,581
43	3,995,582
46	3,995,583
72	3,995,584
204	3,995,585
317	3,995,586
405	3,995,587
426	3,995,588
655	3,995,589
658	3,995,590

CLASS 119

1	3,995,591
16	3,995,592
28	3,995,593
60	3,995,594
61	3,995,595
71	3,995,596
86	3,995,597
106	3,995,598

CLASS 123

8.05	3,995,599
8.13	3,995,600
8.41	3,995,601
8.45	3,995,602
32 EA	Re.29,060
41.51	3,995,603
75 B	3,995,604
	3,995,605
90.12	3,995,606
117 A	3,995,607
148 E	3,995,608
188 S	3,995,609
192 B	3,995,610

CLASS 126

121	3,995,611
139	3,995,612
271	3,995,613
	3,995,614
	3,995,615
	3,995,804
343.5 A	3,995,616

CLASS 127

29	3,996,060
	3,996,061

CLASS 128

1 D	3,995,617
2 B	3,995,618
	3,995,619
2 F	Re.29,061
2 H	3,995,621
2 R	3,995,620
2.06 A	3,995,622
2.06 E	3,995,623
2.06 R	3,995,624
142.2	3,995,625
	3,995,626
142.7	3,995,627
214 C	Re.29,062
214.4	3,995,628
215	3,995,629
218 DA	3,995,630
260	3,995,631
	3,995,632
	3,995,633
	3,995,634
	3,995,635
285	3,995,636
287	3,995,637
	3,995,638
	3,995,639
	3,995,640
335	3,995,641
349 R	3,995,642
351	3,995,643
418	3,995,644

CLASS 130

27 T	3,995,645

CLASS 131

17 R	3,995,646

CLASS 132

74.5	3,995,647
84 B	3,995,648

CLASS 134

2	3,996,062
22 C	3,996,063

CLASS 135

4 R	3,995,649
72	3,995,650

CLASS 136

89	3,996,067
233	3,996,070
	3,996,071

CLASS 137

38	3,995,651
102	3,995,652
234	3,995,653
270	3,995,654
318	3,995,655
497	3,995,656
529	3,995,657
543	3,995,658
614.03	3,995,659
625.48	3,995,660
807	3,995,661
825	3,995,662

CLASS 138

38 3,995,663
43 3,995,664
147 3,995,665

CLASS 141

3 3,995,666
18 3,995,667
34 3,995,668
392 3,995,669
3,995,670

CLASS 144

34 E 3,995,671
193 A 3,995,672

CLASS 148

6.15 R 3,996,072
3,996,073
6.16 3,996,074
13.1 3,996,075
18 3,996,076
187 3,996,077

CLASS 149

2 3,996,078
21 3,995,673
35 3,996,079
92 3,996,080

CLASS 150

52 3,995,674

CLASS 151

69 3,995,675

CLASS 152

410 3,995,676

CLASS 156

48 3,996,081
73.5 3,996,082
92 3,996,083
93 3,996,084
97 3,996,085
194 3,996,086
197 3,996,087
211 3,996,088
235 3,996,089
244 3,996,090
285 3,996,091
309 3,996,092
358 3,996,093
608 3,996,094
610 3,996,095
620 3,996,096

CLASS 162

30 K 3,996,097
273 3,996,098

CLASS 164

15 3,995,677
49 3,995,678
86 3,995,679
128 3,995,680
154 3,995,681
281 R 3,995,682
282 3,995,683
283 S 3,995,684
386 3,995,685

CLASS 165

11 3,995,686
13 3,995,687
165 3,995,688
166 3,995,689

CLASS 166

52 3,995,690
105 3,995,691
268 3,995,693
285 3,995,694
302 3,995,695
318 3,995,692

CLASS 172

7 3,995,696
440 3,995,697
719 3,995,698
3,995,699

CLASS 173

2 3,995,700
43 3,995,701
91 3,995,702
105 3,995,703

CLASS 174

23 C 3,996,413
28 3,996,414
48 3,996,415
68.5 3,996,416
90 3,996,417

CLASS 175

69 3,995,705
392 3,995,706
414 3,995,707

CLASS 176

49 3,996,099
68 3,996,100
78 3,996,101
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CLASS 177

126 3,995,708

CLASS 178

5.1 3,996,418
6 3,996,419
6.8 3,996,420
7.1 Re.29,067
7.3 D 3,996,421

CLASS 179

15 A 3,996,422
15 BF 3,996,423
18 DA 3,996,425
18 J 3,996,424
84 A 3,996,426

CLASS 180

70 R 3,995,709
104 3,995,710
133 3,995,711

CLASS 181

53 3,995,712
119 3,995,713

CLASS 182

100 3,995,714
129 3,995,715
186 3,995,716

CLASS 184

7 F 3,995,717

CLASS 185

39 3,995,718

CLASS 187

29 R 3,995,719

CLASS 188

33 3,995,720
71.8 3,995,721
71.9 3,995,722
72.4 3,995,723
165 3,995,724

CLASS 191

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CLASS 192

106.2 3,995,726
113 B 3,995,727

CLASS 194

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CLASS 195

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5 3,996,104
28 R 3,996,105
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31 R 3,996,107

CLASS 197

1 R 3,995,729
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CLASS 198

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16 C 3,996,431
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61.79 3,996,434
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67 B 3,996,435
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141 3,996,109
248 3,996,110

CLASS 203

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38 3,996,112
58 3,996,113

CLASS 204

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91 3,996,118
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195 R 3,996,123
228 3,996,125
271 3,996,126
281 3,996,127

CLASS 206

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387 3,995,737
451 3,995,738
484 3,995,739
520 3,995,740

CLASS 208

89 3,996,128
102 3,996,129
243 3,996,130

CLASS 209

111.5 3,995,741

CLASS 210

23 H 3,996,131
31 C 3,996,132
45 3,996,133
59 3,996,134
62 3,996,135
86 3,996,136
130 3,996,137
170 3,996,138
198 R 3,996,139
205 3,996,140
501 3,996,141

CLASS 211

60 R 3,995,742
65 3,995,743
131 3,995,744

CLASS 214

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1 BD 3,995,746
1 P 3,995,747
6 D 3,995,748
10.5 R 3,995,749
11 R 3,995,750
15 D 3,995,751
16.4 A 3,995,752
17 CB 3,995,753
83.26 3,995,754
140 3,995,755
147 T 3,995,756
309 3,995,757
330 3,995,758
356 3,995,759
515 3,995,760
776 3,995,761

CLASS 215

256 3,995,762

CLASS 219

10.49 3,996,442
56 3,996,443
58 3,995,870
63 3,996,444
69 C 3,996,445
99 3,996,446
541 3,996,447

CLASS 220

74 3,995,763
263 3,995,764
281 3,995,765
282 3,995,766

CLASS 221

82 3,995,767
197 3,995,768

CLASS 222

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61 3,995,771
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370 3,995,777
399 3,995,778
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3,996,456
184 3,996,457

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3,995,333	3,995,987	3,996,331	3,995,415	3,996,603	3,995,983
3,995,359	3,995,988	3,996,333	3,995,426	18 : 3,995,398	3,996,120
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3,995,384	3,996,010	3,996,514	3,995,463	3,995,487	3,996,257
3,995,387	3,996,024	3,996,522	3,995,469	3,995,491	3,996,455
3,995,392	3,996,029	3,996,558	3,995,485	3,995,529	3,996,462
3,995,394	3,996,043	3,996,566	3,995,500	3,995,597	3,996,474
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3,995,427	3,996,070	3,995,435	3,995,517	3,995,663	3,996,506
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3,995,433	3,996,115	3,995,587	3,995,531	3,995,723	25 : 3,995,340
3,995,442	3,996,131	3,995,615	3,995,532	3,995,785	3,995,353
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3,995,475	3,996,182	3,995,679	3,995,638	3,995,965	3,995,586
3,995,480	3,996,199	3,995,725	3,995,639	3,996,196	3,995,649
3,995,492	3,996,243	3,995,730	3,995,640	3,996,521	3,995,699
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3,995,544	3,996,265	3,995,840	3,995,668	3,995,617	3,995,925
3,995,560	3,996,268	3,995,956	3,995,671	3,995,694	3,996,002
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3,995,647	3,996,372	3,996,317	3,995,772	3,995,555	3,996,189
3,995,651	3,996,379	3,996,482	3,995,846	3,995,631	3,996,203
3,995,664	3,996,380	3,996,598	3,995,863	3,995,635	3,996,259
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3,995,670	3,996,421	3,995,901	3,995,886	3,995,894	3,996,330
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3,995,705	3,996,458	3,996,376	3,995,931	3,995,736	3,996,436
3,995,750	3,996,460	11 : 3,996,484	3,995,972	3,996,083	3,996,448
3,995,774	3,996,464	12 : 3,995,445	3,995,982	3,996,282	3,996,469
3,995,780	3,996,468	3,995,626	3,996,015	3,996,434	3,996,470
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6 :	242,591	17 :	242,621	25 :	242,602	34 :	242,600		242,645		242,619
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	242,596	18 :	242,604		242,609		242,657		242,649		242,625
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12 :	242,613		242,650	27 :	242,594		242,616	42 :	242,587	55 :	242,589
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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10 :	T953,009	25 :	T953,007		T953,006		T953,012		T953,010		
17 :	T953,008	26 :	T953,003	34 :	T953,002	36 :	T953,005	39 :	T953,011	47 :	T953,004

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*